



**Project no**

NMP2-CT-2004-510314

**Project acronym**

ANVOC

**Project title**

Application of Nanotechnologies for Separation and Recovery of Volatile Organic  
Compounds from Waste Air Streams

**Instrument:** SSA

**Thematic Priority:** Nano-technologies and nano-sciences, knowledge-based multifunctional materials, and new production processes and devices – ‘NMP’

**PUBLISHABLE FINAL ACTIVITY REPORT**

**Period covered:** from July 1, 2004 to June 30, 2005

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**Project coordinator name :** Dr. Ebru MEHMETLI

**Project coordinator organisation name :** TUBITAK MRC

**Revision :** -

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## 1. PROJECT EXECUTION

The aim of the project was to unify and coordinate the efforts and disseminate the knowledge of the scientists working in the Application of Nanotechnologies for Separation and Recovery of Volatile Organic Compounds from Waste Air Streams. These have been performed via symposium activities. Special accent has been young scientists, post-doctoral, PhD students, MSc students in technological branches of the European society. In practice this has been an attempt for effective cooperation of academic and scientific researchers and industry.

The ANVOC Symposium has presented the latest developments in the area of membrane technologies for the VOC separation from gaseous wastes. Effective technology transfer between the research centres, universities and their industrial participants has been provided.

The ANVOC Symposium has emphasized the need for using membrane technology in the industry, and therefore, the necessity to increase the market for membrane technology in Europe, and also has showed the use of membrane technology in separation and recovery of organic compounds from waste air streams since VOCs produce a large amount of waste emissions which cause not only a severe environmental pollution problem but also a significant economic loss.

Briefly, the ANVOC Symposium has:

- Provided experts come together to share and transfer their knowledge in this field of science and technology,
- Created a large group from Member States and Candidate Countries' institutions engaged in membrane technology,
- Showed the R&D activities in this field,
- Identified the use of different membrane materials in gas separation,
- Identified the membrane types used for the recovery of VOCs,
- Brought together a wide range of people from different sectors and backgrounds who have an interest in air quality,
- Created possibilities of launching new cooperation in this field,
- Disseminated the results obtained so far.

The experience that has been gained in this field has been spread, as stated before, through a symposium and proceedings published. Information dissemination, which is the outcome of the symposium will be done through in print as proceedings and also through ANVOC website and this will bring specialists in the membrane technology.

ANVOC consists of 3 participants from candidate countries, one from Bulgaria and two from Turkey, and 1 participant from Member State, the Netherlands. The coordinator and the contractor information are as follows:

TUBITAK-Marmara Research Centre, Turkey (the coordinator);

Kocaeli University, Turkey;

University of Twente - European Membrane Institute – EMI (UT-EMI), the Netherlands;

University of Chemical Technology and Metallurgy, Bulgaria.

The coordinator of the project was Dr. Ebru MEHMETLI, and her contact information are given below:

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The first step in ANVOC was to establish a Project Management Committee. This committee was established in early July and composed of one representative from each participant organization. The main aim of the committee is to define the route for the ANVOC. Project Management Committee is responsible for the scientific and technical work and also directing and coordinating the Working Subcommittees to finalize the ANVOC successfully.

The Working Subcommittees were established by the Project Management Committee. Each Subcommittee was composed of one representative from each participant organization. The Working Subcommittees are listed below:

- The Program Committee
- The Publication Committee
- The Publicity & Public Relation Committee
- Local Arrangement Committee.

The methodology of the organization of ANVOC was based on five Work Packages. The workpackages covered the objectives of the project, and included project management, administrative and technical work for the organization of the symposium.

Each Subcommittee composed of one representative from each participant organization was responsible for one workpackage. The content of each workpackage, which is called as sub-tasks, is directly related to the responsibility of the Working Subcommittees. The sub-tasks in each work package were shared between four participants to fulfill the project.

**Table 1.** The work packages and the working subcommittees.

| <b>Work Package No</b> | <b>Work Packages</b>        | <b>Working Subcommittees</b>              |
|------------------------|-----------------------------|---|
| 1                      | Project Management          | The Project Management Committee          |
| 2                      | Symposium Program           | The Program Committee                     |
| 3                      | Publication & Dissemination | The Publication Committee                 |
| 4                      | Publicity & Public Relation | The Publicity & Public Relation Committee |
| 5                      | Local Arrangement           | Local Arrangement Committee               |

The duties of the Working Subcommittees were defined by the Project Management Committee and they are given below as sub-tasks:

*The Program Committee*

- Determination of the topics of Technical Program of the ANVOC
- Determination of all prospective authors and session organizers
- Review submitted papers
- Review and select papers for presentation
- Organize sessions and select session chairs
- Correspond with authors on accept/rejects
- Determine author instructions
- Provide instructions to speakers

*The Publication and Dissemination Committee*

- Design of the Symposium Logo
- Design and printing of the Call for Papers - Brochure
- Design and printing of Symposium Proceedings and CDs
- Design of the Website
- Final Program

*The Publicity & Public Relation Committee*

- Arrangement for publicity mailing list
- Arrangement for mailing of the First Announcement & Call for Papers
- Arrangement for mailing of the Second Call for Papers
- Arrangement of Registration & Organization for the registration – help desk

*Local Arrangement Committee*

- Signage and Audio visual arrangements
- Monitor coordination
- Arrangement of symposium hall
- Travel arrangements for honour guests
- Hotel arrangements for honour guests
- Hotel arrangements for attendees
- Social program planning
- Arrangement of lunch, cocktail and welcome dinner
- Excursion

**Table 2.** The involvement of the participants into work packages and the sub-tasks.

| Work Package  | Participant No |   |   |   |
|---|----------------|---|---|---|
| 1.Project Management  | 1              | 2 | 3 | 4 |
| Management of the Consortium  | √              |   |   |   |
| Scientific coordination   |                |   | √ |   |
| Administrative coordination   |                | √ |   |   |
| Integration of the partners   |                |   |   | √ |
| Financial management  | √              |   |   |   |
| Management of the information flow                                    |                | √ |   |   |
| Management of the outcome resulting from the project                  | √              |   |   |   |
| 2. Symposium Program  |                |   |   |   |
| Determination of the topics & range of Technical Program of the ANVOC | √              | √ | √ | √ |
| Determination of all prospective authors and session organizers       |                |   | √ | √ |
| Review and tract submitted papers                                     | √              | √ | √ | √ |
| Review and select papers for presentation                             | √              | √ | √ | √ |
| Organize sessions and select session chairs                           | √              | √ |   |   |
| Correspond with authors on accept/rejects                             | √              | √ | √ | √ |
| Determine author kits, incl. page limits                              | √              |   |   |   |
| Provide instructions to speakers                                      | √              |   |   |   |
| Work in coordination with other committees                            | √              | √ | √ | √ |



**Table 3.** The involvement of the participants into work packages and the sub-tasks (Continue).

| Work Package  | Participant No |   |   |   |
|---|----------------|---|---|---|
|   | 1              | 2 | 3 | 4 |
| <b>3. Publication &amp; Dissemination</b>                                       |                |   |   |   |
| Design of the Symposium logo  | √              |   |   |   |
| Design and printing of the Call for Papers - Brochure                           | √              |   |   |   |
| Design and printing of Symposium Proceedings                                    |                |   | √ | √ |
| Design of the website   |                |   | √ | √ |
| Final Program   | √              | √ |   |   |
| Luncheon and Banquet Menus  | √              | √ |   |   |
| <b>4. Publicity and Public Relation</b>   |                |   |   |   |
| Arrangement for publicity mailing list  | √              | √ | √ | √ |
| Arrangement for mailing of the First Announcement & Call for Papers             | √              | √ |   |   |
| Arrangement for mailing of the Second Call for Papers                           | √              | √ |   |   |
| Arrangement of Registration & Organization for the registration – help desk     | √              | √ |   |   |
| <b>5. Local Arrangement</b>   |                |   |   |   |
| Signage and Audio visual arrangements   | √              | √ |   |   |
| Monitor coordination  | √              |   |   |   |
| Arrangement of symposium hall   | √              |   |   |   |
| Travel arrangements for honor guests  | √              |   |   |   |
| Hotel arrangements for honor guests   | √              |   |   |   |
| Hotel arrangements for attendees  | √              |   |   |   |
| Social program planning (Arrangement of lunch, cocktail, dinner, and excursion) | √              | √ |   |   |

After the symposium topics were defined by the Program Committee, a brochure including the tentative agenda, highlights, events, the purpose of the symposium, and information about accommodation, ANVOC website address, and contact information for the planners has been designed, printed and has posted to the address of 314 (242 international and 72 national) potential participants including academicians, industrialists, researchers and students. The brochure has also been sent electronically via e-mail to almost 1000 people.

In order to provide the communication between project partners, to help the organization of the symposium and to disseminate the information and the outcomes of ANVOC such as papers, presentations, etc of the symposium to the participants as well as to the society and to the public the web infrastructure of ANVOC has been designed. The website address of ANVOC is as follows: <http://www.membrane.nl/anvoc2005>.

The Project Management Committee decided on the important days as given below. These data were printed in the brochure and also posted at the website. However, only a few people mentioned their participation in ANVOC Symposium by pre-registration, and only two abstracts were received by January 31, 2005.

Submission of Abstracts : January 31, 2005

Acceptance Notification : February 28, 2005

Submission of Papers : April 11, 2005

End of Early Registration : May 20, 2005

Most of the people did not reply back, and the academicians who replied back declared that they are busy due to the final exams. Some others mentioned that they prefer to attend to the International Conference on Membranes (ICOM2005) in South Korea in August 2005, and since this will be an expensive travel, they cannot divide their budget into two for ANVOC Symposium.

The Project Management Committee has disappointed and decided to postpone the dates as given below. The new dates has been posted at the ANVOC website with a pop-up.

Submission of Abstracts : March 1, 2005  
Acceptance Notification : March 24, 2005  
Submission of Papers : April 22, 2005  
End of Early Registration : May 23, 2005

The committee decided to invite one keynote speaker from European Union and one from the US. The committee applied to the ANVOC Project Officer to find out whether the travel and accommodation expenses of the invited keynote speaker from the US can be covered from the ANVOC budget. The officer advised just to cover the accommodation of the invited keynote speaker coming from the US.

In order to choose the keynote speakers, the Project Management Committee asked to the Program Committee to search for the scientific papers and proceedings of the conferences/congresses etc., and the members of European Membrane Society. Some informative e-mails have been sent to the selected prospective keynote speakers and then official invitation letters have been sent if required.

One of the European scientists from Germany accepted our invitation. In order to increase the number of the keynote speakers the Project Management Committee has also invited a scientist from the US. The scientist from the US accepted our invitation by providing his airfare himself. Therefore, only the accommodation of the American keynote speaker was supported by ANVOC budget.

In order to attract people, the names of the invited keynote speakers were posted at the website with a pop-up.

The total number of abstracts received was 31 by March 1, 2005. The abstracts were evaluated, and 21 abstracts were chosen as oral and 10 abstracts were chosen as poster presentation. The authors were notified about the result of their abstract and reminded to send their papers by April 22, 2005.

Apart from the number of the presenters, the number of the applications to attend to the symposium were also too few. The universities, especially the chemical engineering departments, chemistry departments and the environmental engineering departments in

Turkey were called by phone by the project coordinator to find out the reason of this low interest in ANVOC Symposium. Most of the researchers told that they couldn't get any funding from the university to pay for the registration fee and also for the travel and accommodation expenses. They expressed that although they are interested in attending to the ANVOC Symposium, the financial problems are preventing them doing so.

Therefore, the Committee decided to invite academicians, researchers and especially students to attend to the ANVOC Symposium free of charge. The Committee paid attention to invite mostly students to let them join to a scientific meeting to make contacts with other researchers and even find scholarships for their PhDs or post-doctorates. Most of the invited researchers and students accepted the offer of the Project Management Committee and declared that they will attend to the symposium.

The draft symposium program was prepared covering 3 days, however, the Project Management Committee could not be satisfied by the total number of the presentations. In order to increase the number of the presenters, the Project Management Committee decided to invite a couple scientists to make presentations and also decided to invite the third invited keynote speaker to lecture during the ANVOC Symposium.

The committee decided to look for a sponsorship to cover the travel and accommodation expenses of the invited scientists since it was not possible to cover these kind of expenses from the project budget. Finally, 9 scientists from European Union were invited to the symposium to make presentations and 1 scientist from the US was invited as an invited keynote speaker. As for the invited keynote speaker from the US, the committee decided to pay only for the accommodation as the ANVOC Project Officer had recommended before.

Only two of the scientists from the European Union accepted the invitation of the committee. The invited keynote speaker from the US also accepted the invitation of the Project Management Committee, and also accepted to pay for his own travel expenses.

During waiting for the respond of the invited scientists, the Project Management Committee started to contact to the companies and associations to get their sponsorship. The committee applied to "Fondation d'entreprise Total" via official website of TOTAL, to "Automotive Manufacturers Association" via e-mail and to "Petroleum Industry Association in person by

Dr. Ebru MEHMETLI. The respond received from the Fondation d'entreprise Total was attached to this report (Annex 1).

Fondation d'entreprise Total and Petroleum Industry Association did not accept to be the sponsor of the ANVOC symposium, however, Automotive Manufacturers Association accepted to be the ANVOC sponsor. The Automotive Manufacturers Association sponsored ANVOC Symposium with 2500 €. *The person responsible for financial issues of the Automotive Manufacturers Association directly contacted to the invited speakers and transferred their airfares for economy class via bank transfer. The accommodation expenses of these invited speakers also paid directly by the Automotive Manufacturers Association. Therefore, there was no money transfer to TUBITAK MRC from the sponsor.*

The full papers were received by May 9th, 2005 after the deadline of the paper submission, and printed as hardcopy and also were burnt in CD-ROMs.

By the end of May 27th, 2005, 120 people confirmed their participation to ANVOC Symposium. However, totally 64 people attended to the ANVOC Symposium. Although the Project Management Committee was disappointed with the number of the participants, most of the experienced scientists expressed that 64 is an optimum number for the participants to concentrate on the presentations and on the topics, and also to make contacts for further collaborations.

The ANVOC Symposium was held at Hilton Hotel Istanbul from May 30<sup>th</sup> to June 1<sup>st</sup>, 2005. The scientific part of the symposium has included oral presentations, poster presentations and lectures of the invited keynote speakers. Presented papers were in sessions throughout the core symposium days. Poster papers were aimed at authors wishing to present late breaking results, work in progress for comment or where the demonstration of the paper was important. The topics of the symposium have been specified under 4 topics which determine the SESSIONS. The topics of the sessions are given below:

Session 1 : VOC Separation

Session 2 : Membrane Systems, Mixed Matrix Membranes

Session 3 : Available Technologies

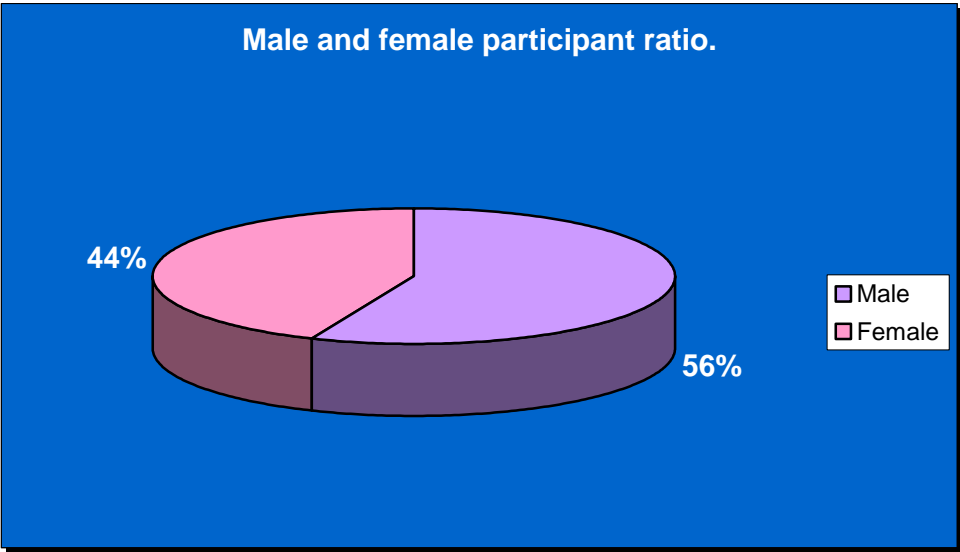
Session 4 : Gas Separation.

A Brokerage Event was organized in the evening of May 30<sup>th</sup>, 2005 after the sessions finished. A core group of 10 people including partners and invited keynote speakers was established. The meeting was directed by Dr. Ebru MEHMETLI. The aim of the event was to discuss the potential project proposals and EU funding opportunities.

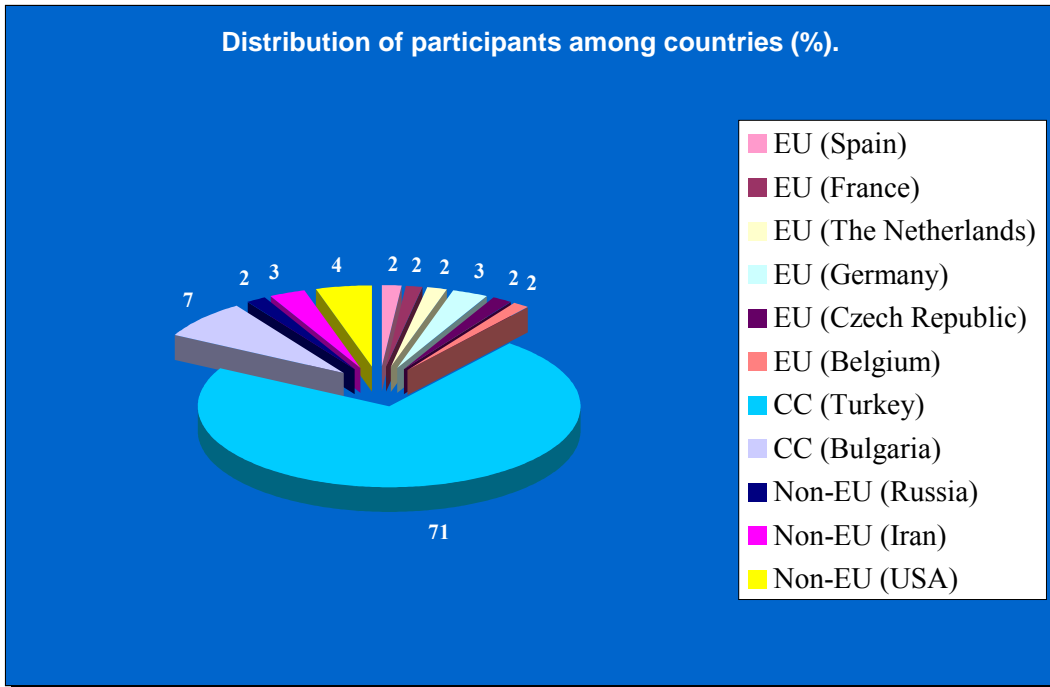
Refereed papers have been printed in symposium proceedings and also burnt in CD-ROMs to distribute to the participants within symposium bags during registration.

The social program including the symposium dinner and the half-day city tour were organized for the participants in order to let them come together in an informal ambience to step further for the future collaboration.

As mentioned before, totally 64 people have attended to the ANVOC Symposium. 44% of the participants were female and the 56% of them were male. This ratio shows that approximately half of the participants were females (Figure 1).

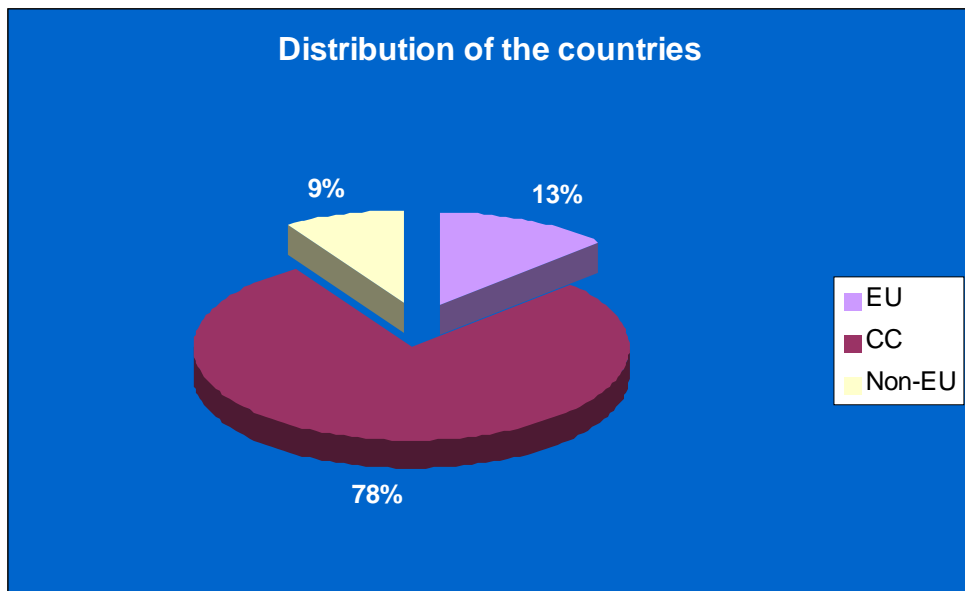


**Figure 1.** Male and female participant ratio.



**Figure 2.** Distribution of participants among countries (%).

Figure 2 shows that Turkish participants allocate the 71% of the total number. This indicates that the goal of the ANVOC Symposium (knowledge transfer to CCs) met the target.



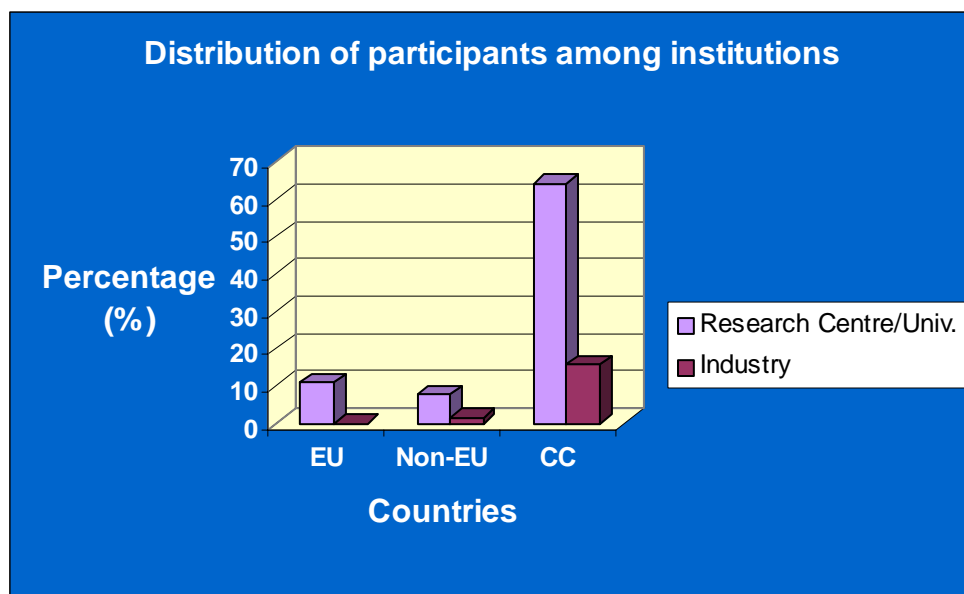
**Figure 3.** Distribution of the countries.

Figure 3 illustrates that totally 9% of the participants were from countries including Non-EU countries as USA, Russia and Iran and 13% of them were from EU Countries. 78 % of the participants were from Candidate Countries (Bulgaria and Turkey).

**Table 4.** Distribution of participants among institutions.

|                            | EU       | Non-EU   | CC        | TOTAL     |
|----------------------------|----------|----------|-----------|-----------|
| Research Centre / Industry | 7        | 5        | 41        | 53        |
| Industry                   | 0        | 1        | 10        | 11        |
| <b>TOTAL</b>               | <b>7</b> | <b>6</b> | <b>51</b> | <b>64</b> |

The number and the percentage of the participants representing institutes / research centres and industry are given in Table 3 and Figure 4, respectively. Most of the participants representing industry in Candidate Countries (Turkey) were from automotive sector.



**Figure 4.** Distribution of participants among institutions.

There were 1 MSc student and 12 PhD students attending to ANVOC Symposium.



| QUESTIONNAIRE for ANVOC   |                  |           |          |             |  |
|---|------------------|-----------|----------|-------------|--|
|   | Highly Satisfied | Satisfied | Adequate | Unsatisfied | COMMENTS   |
| 1. Novelty of the topics and technologies?  | 8                | 13        | 7        | 0           | Some new ideas and innovation exists.  |
| 2. Are you satisfied with the knowledge you have gained during the symposium?                             | 7                | 11        | 10       | 0           |  |
| 3. Are you likely to apply what you have learnt during the course of your activities?                     | 3                | 15        | 6        | 3           | 1. More industrial applications have been expected in the presentations.   |
| 4. Do you think this symposium contributed to initiate new professional relationship in your area?        | 12               | 6         | 5        | 5           | 1. To the high extend.   |
| 5. How was the contribution of the social activities as a platform to discuss professional opportunities? | 15               | 11        | 1        | 1           | 1. Perfect and effective<br>2. The number of participants allows an easy and friendly interaction.   |
| 6. Was the distribution of the presentations versus sessions reasonable?                                  | 16               | 9         | 2        |             | 1. The majority of the communication has been oral presentations, i.e. The fruitful way to spread information and knowledge  |
| 7. The content of the presentations?  | 4                | 12        | 10       | 1           |  |
| 8. The academic worth of the presentations?   | 10               | 12        | 5        | 1           |  |
| 9. Symposium facilities?  | 21               | 6         | 1        | 0           | 1. Perfect<br>2. Excellent   |
| 10. Any points you would like to comment on?  |                  |           |          |             | 1. Participation of scientists is less than 30-33 years old<br>2. The organizer and sponsors (EC and OSD) are greatly acknowledged due to this very important organization took place in Turkey. |
| THANK YOU...  |                  |           |          |             |  |

28 participants in total 64, returned their questionnaires back to the registration desk. Most of the participants ticked for “Highly Satisfied” and “Satisfied”. The highest numbers are seen at the questionnaire above.

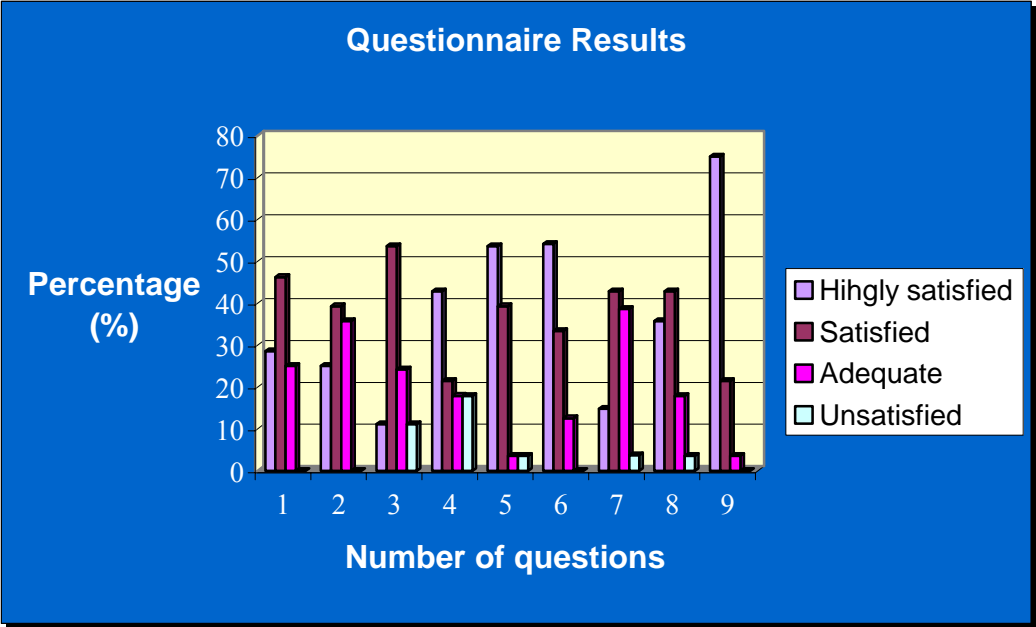


Figure 5. Questionnaire results.

## **1.1. Work Package Progress of the Period**

### **1.1.1 WP1: Project Management**

Project management was provided by the Project Management Committee. The committee consisted of one representative from each project partner.

The management of ANVOC included the following:

- Management of the Consortium,
  - Scientific coordination
  - Administrative coordination
  - Integration of the partners
- Financial management,
- Management of the information flow
- Management of the outcome resulting from the project

Project Management Committee was responsible for the scientific and technical work and also directing and coordinating the working subcommittees to finalize the ANVOC successfully.

One meeting with the coordinator was held at UT-EMI on Tuesday, June 15th, 2004 (before the contract), to prepare the start of all ANVOC activities and discuss scientific coordination. Antoine Kemperman (UT-EMI) was one of the members of the Project Management Committee on behalf of UT-EMI. Both Antoine Kemperman and Geert-Henk Koops were involved in the Scientific Advisory Committee. Due to a new position outside UT-EMI, Geert-Henk Koops was not involved in the project anymore from March 1st, 2005 on. This is the only major change in WP1 concerning UT-EMI.

With the Project Management Committee, the next step was to figure out a strategy for the symposium. Most importantly, the goals to dictate the rest of the symposium plan and the timeline for the program and the outreach of the symposium were defined and targets were set for attendance. The Project Management Committee defined the necessary steps for the organization of the symposium as following:

- Announcement of the symposium (call for papers, brochures, official website)
- Review of abstracts
- Evaluation of papers
- Invitation of keynote speakers
- Registration of participants
- Printing of proceedings and CDs
- Execution of symposium
- Review of symposium results and planning further steps for follow up collaborations
- Symposium closing
- Final reporting.

Project Management Committee provided the information flow from working sub-committees to the Project Manager. The Committee received the reports from the Working Sub-Committees about on-going works in each work package and reported this information to the Project Manager.

The Project Management Committee was also responsible for the management of financial resources. These resources are:

- Bank transfer
- Budgeting
- Cash Flow
- Income
- Expenses
- Auditing
- Records
- Cash handling
- Financial Reports

The control of financial reports is the responsibility of the Project Management Committee. Each partner institution worked with an independent external auditor to provide the audit and the evaluation of the financial reports.

The Project Management Committee inspected the working subcommittees, and provided coordination among each committee. In this work package, the Project Management Committee established a cluster between the partners and also between each working subcommittee through the project. The partners and therefore the working subcommittees worked in harmony with a good relationship.

### ***Deliverables***

*D8*. Final report from ANVOC to the European Commission

The deliverable of WP1 will come out by completing this final report.

### ***Milestones and expected result***

*M1* : The Project Management Committee was established.

*M2* : The necessary steps for preparing the symposium were defined

The Project Management Committee was the group who directed all subcommittees and provided the workflow all through the project. Therefore, the establishment of this committee was very important. After establishment, the committee defined all the steps for realizing the symposium and followed each step to reach the success.

### ***Expected results***

The integration of the partners and the coordination among the other committees level and overall project was provided.

## **1.1.2 WP2: Symposium Program**

The aim of this work package was to arrange and perform all technical work that is necessary to organize the symposium. The Program Committee was responsible for realizing all the sub-tasks under the so-called work package. The Program Committee aimed to ensure the technical quality of the symposium.

The Committee was responsible for technical aspects of the programme. When the Program Committee hold its first meeting to hand out the agenda they thought carefully about how the agenda was going to accomplish the goals. VOC removal is very limited in Europe, and it was

expected that the subject was too narrow to attract enough participants. Therefore, the topics were extended to gas separation with membranes, mixed matrix membranes, and carbon membranes. In this respect, the Technical Program of ANVOC and its topics were determined by reflecting the goals of the symposium.

The topics are listed below:

- Implementation of nanotechnologies in the field of VOC emission reduction,
- Available technologies for VOC separation and/or reduction in industry,
- Membrane systems for VOC separation from gaseous streams,
- VOC removal from organic vapor / air streams by membrane technologies,
- Estimation, simulation and mathematical modeling of VOC emission reduction by using membranes,
- VOC control by nanotechnologies: Current practices and future trends.
- Recovery / removal of VOCs from wastewater by membrane processes,
- Gas separation with membranes,
- The use of mixed matrix membranes
- Carbon membranes for gas and organics.

UT-EMI and UCTM worked together to determine the prospective authors and prepared international mailing list in order to send the ANVOC brochure. UT-EMI carried out an extensive literature search of scientific papers which appeared on these subjects between 2000 and 2004. An extensive name and address list of scientists working in the field of ANVOC was prepared.

The topics have been printed in the brochure (Annex 2) and mailed to the scientists and also have been posted at the website of ANVOC. Following the on-line pre-registration of the participants, the abstracts have been collected to be reviewed.

The committee also invited the keynote speakers. In order to choose the keynote speakers, scientific papers and proceedings of the conferences/congresses and the members of European Membrane Society have been searched. First informative e-mails have been sent to the selected prospective keynote speakers and then official invitation letters have been sent if required.

One of the European scientists accepted our invitation. In order to increase the number of the keynote speakers the Project Management Group has decided also to invite scientists from US. Two well-known scientists from US accepted our invitation by providing their airfares. Therefore, only the accommodation of the American keynote speakers was supported by ANVOC budget.

The abstracts received from the interested scientists have been reviewed and the authors have been notified on acceptance or rejection of their abstracts. The evaluation list of the selected abstracts has been enclosed to the report (Annex 3). The abstracts have been collected under a couple of topics depending on their contents. Therefore the topics given above have been specified under 4 topics which determine the SESSIONS. The topics of the sessions are given below:

Session 1 : VOC Separation

Session 2 : Membrane Systems, Mixed Matrix Membranes

Session 3 : Available Technologies

Session 4 : Gas Separation.

Each invited keynote speaker has lectured under each session except session 3. The invited keynote speakers have been kindly asked to chair the sessions. And they accepted the invitation of the committee.

The instructions for guidance regarding the format to prepare the full papers, oral presentations and poster presentations have been determined and posted at the ANVOC website. These were e-mailed to the authors either when required.

After notification of the abstracts, the symposium program has been prepared (Annex 4). The presentations have been concentrated under related session in a day. This provided participants to concentrate on the presentations. The symposium program has been posted at the ANVOC website and also sent to the participants.

### ***Core Symposium Days***

The scientific part of the symposium lasted for 2.5 days (from May 30<sup>th</sup> to June 1<sup>st</sup> 2005). This part of the symposium has included oral presentations, poster presentations and lectures

of the invited keynote speakers. Refereed presentations at the Symposium were of two types; oral and poster presentations.

Presented papers were in sessions throughout the Core Symposium days. Poster papers were aimed at authors wishing to present late breaking results, work in progress for comment or where the demonstration of the paper was important. One of the poster presenters representing a company importing and marketing equipment e.g., GC, GCMS, HPLC, also made demo of an equipment detecting VOC at stack. The poster presentation and the demo of this company have appealed the interest of the participants.

The social part of the ANVOC Symposium has been issued under WP5.

The overall work performed under WP2 is summarized below:

- Determination of the topics of Symposium Program
- Determination of all prospective authors and session organizers
- Review and tract submitted abstract
- Correspond with authors on accept/rejects
- Review and select papers for oral/poster presentation
- Organize sessions and select session chairs
- Determine author instructions
- Provide instructions to speakers and poster presenters

### ***Deliverables***

*D1.* Reviewed abstracts

*D2.* Reviewed and selected papers

### ***Milestones and expected result***

*M3.* The Program Committee was established.

*M4.* The general outline of the symposium was defined.

### ***Expected results***

The integration of the partners and the coordination both on work package level and overall project was provided.



### **1.1.3 WP3: Publication & Dissemination**

The work package includes the design of symposium logo, preparation of call for papers, printing of symposium proceedings and CD-ROM, design of website of ANVOC, preparation of symposium program, and all the arrangements for the organization of luncheon and banquet and the menu. During the preparation of the call for papers and the symposium program the Publication & Dissemination Committee has been in contact to the Program Committee working for WP2.

The Publication & Dissemination Committee was formed. The symposium logo and the brochure were designed, and also printed by TUBITAK MRC. Other partners proposed their comments on the brochure. The brochure contained the tentative agenda, highlights events, the purpose of the symposium, and information about housing, plus ANVOC website address, and contact information for the planners. A pre-registration form was also placed in the brochure in order to find out the people who are interested in ANVOC Symposium and inform them via e-mail about the progress in ANVOC.

One of the aims of this work package is to prepare the web infrastructure of ANVOC to provide the communication between project partners, to help the organization of the symposium and to disseminate the information and the outcomes of ANVOC such as presentations, papers, etc of the symposium to the participants as well as to the society and the public.

UT-EMI was responsible for the design and building of the Web site. An interactive Web site has been built by UT-EMI. The Website was stored on a server of UT-EMI at <http://www.membrane.nl/anvoc2005>. The Website consisted of a pop-up when entering the Website, informing visitors on the latest news. Then, the home page appeared. Layout of this home page was based on this page, visitors could choose out of 7 menus and submenus:

1. Information (Introduction, Istanbul, Venue)
2. Program (Symposium Topics, Advisory Committee, Technical Program, Exhibition, Social Activity)
3. Registration (Pre-registration, Registration)
4. Accommodation

5. Travel Guide
6. Abstract/Paper (Abstract Submission, Paper Submission, Oral/Poster Presentation)
7. Contact Us

The Website contained all information necessary for potential participants and presenters of ANVOC. People could pre-register in order to receive information on the meeting. Furthermore, they could use the Website for abstract and paper submission. Attendees could also register on the Website. Essential travel and accommodation information was available via the Website. The Website was 'on-air' December 17th, 2004. In the remaining project time, the Website continuously was updated by UT-EMI. The delivery date is later than foreseen. However, first the symposium subjects, logos, hotels, etc. have to be fixed in order to be able to present them on the Website.

The Symposium website is the primary source of information. The website is using web standards appropriately. The website address of ANVOC Symposium is:

<http://www.membrane.nl/anvoc2005>.

The UCTM activities were concentrated generally on design and printing of the Symposium Proceedings. An intensive work was done for administrative clarification, for the pre- design, design and printing procedure of the ANVOC Symposium Proceedings. After fixation of the final Scientific Program, a design procedure for Symposium proceeding issue was opened. A selection procedure of the respective printing office was made in respect of the most effective in cost, time and quality Proceedings issue. UCTM printing office was met with approval. After clarification of the current technical problems a procedure for design and printing procedure was opened. Parallel for the ANVOC Symposium Proceedings was deposited and an **ISBN 954-8954-55-9** number has been received. Issue work for both in press form and CD-ROM version was accomplished on time. All activities were realized in close cooperation with the project coordinator.

The publications that were prepared by the Publication & Dissemination Committee during the run-up and also at the Symposium are:

- Printed Proceedings of refereed papers (Annex 4)
- CD-ROM of refereed papers (Annex 5)

- Web-version of Proceedings
- Web-version of the Symposium Program
- Pocket Programme for delegates (Annex 6)
- Participation certificates (Annex 7)
- Questionnaires (Annex 8)
- Invitation cards for Symposium Dinner and also for Half Day City Tour (Annex 9)

The pocket program for the delegates were prepared mainly by TUBITAK MRC and KOU. Participation certificates were designed and printed by TUBITAK MRC. The questionnaires were prepared by TUBITAK MRC either.

The symposium proceedings, the CDs, symposium program , Invitation cards for Symposium Dinner and also for Half Day City Tour and questionnaires were distributed within the symposium bag to the participants at the registration / help desk during ANVOC. The results and the comments of the questionnaires will be given in further pages in this report.

### ***Deliverables***

D3. Call for Papers – Brochure

D4. Symposium Proceedings

D5. Website

Additional deliverables have been received in this work package. These are as follows:

- CD-ROM of refereed papers
- Pocket Programme for delegates
- Participation certificates
- Questionnaires
- Invitation cards for Symposium Dinner and also for Half Day City Tour

### ***Milestones and expected result***

M5. The Publication & Dissemination Committee was formed.

M6. The website of ANVOC was created, implemented, and updated.

M7. The proceedings of the ANVOC were published.

### ***Expected Results***

The symposium proceedings were disseminated

The information was disseminated through the website.

#### **1.1.4 WP4: Publicity & Public Relation**

The objective of this work package is to provide an arrangement to let the scientists, researchers, students, membrane producers, industrialists, etc. to come together during the symposium to establish a network.

The Publicity & Public Relation Committee cooperated with the Program Committee and the Publication & Dissemination Committee during the project. All necessary arrangements for preparing the publicity mailing list, mailing the Brochure - Call for Papers and the Second Call for Papers, and publicity of the Symposium Program were performed by this committee.

The Committee outreached to bring people to the ANVOC Symposium by mail, email, and phone calling. The first step in outreach was letting know people as early as possible that the symposium was happening.

The researchers, young scientists and students who are working on nanotechnology, separation technologies (membrane technology) and recovery of VOC, and also the industrialists who are the potential VOC producers were determined and contacted.

Mails regarding to call for papers–brochure were sent to each person for whom the committee contacted within its outreach area. The mailing has included a brochure which had the tentative agenda, highlights events, the purpose of the symposium, and information about housing, plus ANVOC website address, and contact information for the planners. A pre-registration form was enclosed in order to find out the people who are interested in ANVOC Symposium and inform them via e-mail about the progress in ANVOC.

The placement of the ANVOC symposium on the calendars of various publications and websites was arranged. Some of the scientific journals and websites were asked to include the highlights of ANVOC Symposium in their Symposium Calendars/Diary Pages, and also to give a link to ANVOC website. ANVOC conference has been announced at:

## **TUBITAK MRC**

1. [http://www.fp6.org.tr/\\_etkinlikalanlari/nmp/index.htm](http://www.fp6.org.tr/_etkinlikalanlari/nmp/index.htm)
2. [www.mam.gov.tr](http://www.mam.gov.tr) (Web-site of TUBITAK MRC)
3. [http://dbs.cordis.lu/fep-cgi/srchidadb?CALLER=EN\\_NEWS\\_EVENT](http://dbs.cordis.lu/fep-cgi/srchidadb?CALLER=EN_NEWS_EVENT)
4. <http://colab.rsnz.org/nano>
5. <http://www.nanotech-now.com/next-events.htm>
6. <http://www.nanoforum.org>
7. <http://www.nanotec.it>
8. <http://www.nanoclub.rwth-aachen.de/konferenzen.html>
9. [http://europa.eu.int/comm/research/industrial\\_technologies/index\\_en.html](http://europa.eu.int/comm/research/industrial_technologies/index_en.html)
10. <http://www.nanovip.com>
11. <http://www.minatec.com>
12. [www.conicyt.cl/cgi-bin/w3-mysql/agenda/sigue.html?id=1037](http://www.conicyt.cl/cgi-bin/w3-mysql/agenda/sigue.html?id=1037) - 28k
13. [www.infouma.uma.es/documentos/ANVOC.doc](http://www.infouma.uma.es/documentos/ANVOC.doc)
14. [cab.cnea.gov.ar/news/bin/viewNews.pl?Operation=show&ID=10025](http://cab.cnea.gov.ar/news/bin/viewNews.pl?Operation=show&ID=10025)
15. <http://www.nanonet.go.jp/english/calendar>

## **KOU**

1. <http://www.kou.edu.tr/kongsem/kongrealt.htm>

## **UT-EMI**

1. Membrane Discussion List (a web and e-mail based platform for membrane scientists)
2. The Journal of Membrane Science
3. The Membrane Technology Newsletter
4. The EMS Newsletter (a quarterly published newspaper by the European Membrane Society)
5. The NAMS Quarterly (North American Membrane Society)
6. <http://membrane.nl/serve/EMI99/news.html>
7. NMG nieuwsbrief (regular of the Dutch Membrane Society);

## **UCTM**

1. <http://www.euroscience.hit.bg>

The ANVOC Symposium has been introduced to the Turkish people via one of the Turkish national TV channels (Technology Channel). An interview was done by the project coordinator Dr. Ebru MEHMETLI on February 11th 2005 in order to inform scientists, industrialists and the public about ANVOC, its content, importance, EU funding, the importance of recovery of VOCs, membrane systems, nanotechnology, etc. This interview was broadcasted on Thursday 24th, 2005. The copy of the program in a CD-ROM delivered from the TV channel including this interview has been enclosed to this report.

The Press Release prepared by the Project Coordinator in Turkish has been sent to the Turkish Press in May 2005. Another Press Release was prepared and was sent the European Service Network, Belgium, which is a web-based press release for international release at the end of January 2005. Both Press Releases contains the information about the project, partners, objective, the target audience, EC support, topics, and the venue, and they have been enclosed within this report ([http://europa.eu.int/comm/research/industrial\\_technologies/index\\_en.html](http://europa.eu.int/comm/research/industrial_technologies/index_en.html)).

The editor of ESN-European Service Network, Richard Colston, also pressed brief information about ANVOC Symposium in the Magazine of European Industrial Research, Issue 5 (March 2005).

European Industrial Research is a quarterly publication that provides a round up of news and views on innovative EU research in the Sixth Framework Programme (FP6), which is mainly carried out under Thematic Priority 3. Copies of this magazine may be downloaded at [http://europa.eu.int/comm/research/industrial\\_technologies/lists/magazine\\_en.html](http://europa.eu.int/comm/research/industrial_technologies/lists/magazine_en.html). The first, second and the last page of this magazine is attached to the report.

***This task is seen under WP5, Local Arrangements, however, during the flow of work package 4, it was thought that the press release must be done under WP4 since press release is a kind of publicity. Therefore, this task was shifted to work package 4.***

The Publicity & Public Relations Committee collaborated with the Local Arrangement Committee in order to arrange the registration/help desk. A registration group was formed at KOU and this group worked before and during the symposium to create Registration Form, Payment Policy, Method and Currency, and Name Badges, and to arrange all Information and contacts, to assembly of registrations packets, to design the layout of Registrations Area, to

operate On-site Registration and provide Management. The group has distributed the symposium bags with symposium proceedings, the CDs, symposium program, Invitation cards for Symposium Dinner and also for Half Day City Tour and questionnaires. Help desk assistants have guided the participants when necessary.

### ***Deliverables***

#### ***D6. Second Call for Papers***

Additional deliverables have been received in this work package. These are as follows:

- CD-ROM delivered from the Turkish national TV channel (Technology Channel) containing the interview with the project coordinator about ANVOC (Annex 10)
- Press Release (Annex 11).

### ***Milestones and expected result***

*M8.* The Publicity & Public Relation Committee was formed.

*M9.* The scientists, researchers and membrane producers were informed about the ANVOC.

### ***Expected Results***

The symposium has been announced via postal mail, e-mail, TV program and press release, at the websites of other institutions and calendars of the scientific journals. It is believed, ANVOC Symposium has created a new relationship between participants attending from the EU Member States and Candidate Countries.

#### **1.1.5 WP5: Local Arrangement**

The main aim of this work package is to provide some facilities for the comfort of the attendees before and during the symposium.

The Local Arrangement Committee arranged the hotel where the ANVOC Symposium was held and also made all other arrangements related to the venue via following the procurement and negotiation procedures. All local arrangements were made through a Professional Symposium Organizer. The social activities e.g. lunches, symposium dinner and half day old city tour, and accommodation for the attendees, invited keynote speakers and the project partners, and the local travel arrangements for the invited keynote speakers and for the

partners were provided by the Local Arrangement Committee. The members of the committee monitored coordination, and provided communications.

The Local Arrangement Committee organized a “Brokerage Event” during the ANVOC Symposium. The Brokerage Event was took place in the evening of May 30<sup>th</sup>, 2005 after the sessions finished. A core group of 10 people including partners and invited keynote speakers was established. This group had been informed about the brokerage event before they arrived to Turkey. The aim of the brokerage event was to discuss the potential project proposals, EU funding, collaboration between US and European institutions, etc. The meeting was directed by the project coordinator Dr. Ebru MEHMETLI. The core group was asked to propose their ideas and information about the possible funding opportunities during the brokerage event.

During the brokerage event below topics were discussed:

- 2005 Work Programme (SP1-10) of Specific measures in support of international co-operation (INCO),
- Nanotechnologies and nanosciences, knowledge-based multifunctional materials, and new production processes and devices: Identifier: [FP6-2004-NMP-TI-4], Closing Date(s): 15 September 2005,
- NATO Programme for Security Through Science Priority Research Topics,
- National Science Foundation – NSF funding opportunities.

The core group was willing to initiate a new collaboration. One of the suggestions was to appeal industry to be involved in the future collaborations. The core group concluded that the will-be consortium might come together to solve the problems of automotive sector.

The social program including the symposium dinner and the half-day city tour were organized for the participants in order to let them come together in an informal ambience to step further for the future collaboration. The social program gave delegates the opportunity to talk to each other in convivial surroundings. The main events were a Symposium Dinner on Tuesday evening and an old city tour on Wednesday afternoon. During the Symposium, coffee breaks were often organized in close proximity to the Poster Presentations.



### ***Deliverables***

D7. Participation list (Annex 12)

D8. Registration forms (Annex 13)

D9. Azonanoflyer (Annex 14)

The total number of the participants of ANVOC Symposium was 64. The participant list has been attached to this report. The participants filled out a registration form online via ANVOC website or on-site at the venue. The registration form includes personal information e.g; name, surname, address, etc., and registration fees and also payment details.

While the Publicity & Public Relation Committee applied to the websites to include the highlights of ANVOC Symposium in their Symposium Calendars/Diary Pages, and also to give a link to ANVOC website in WP4, the committee also applied to The Institute of Nanotechnology, Stirling, UK. After that, the committee was asked by the Institute of Nanotechnology to put some flyers out at the symposium or included in ANVOC delegate packs detailing some of the events and other ventures we are embarking upon this year. The committee accepted the institute's requirement and included the flyers in the delegate bags. The flyer received from the Institute of Nanotechnology is an additional deliverable of this work package.

The invited keynote speakers were kindly asked to declare their opinions and recommendations about the ANVOC Symposium. Their brief reports were enclosed to this report (Annex 15).

Following the symposium, appreciation messages were received from some of the participants and these were given in Annex 16.

### ***Milestones and expected result***

M10. The Local Arrangement Committee was established.

M11. The Symposium was implemented.

### ***Expected Results***

The first step for the future collaboration in membrane and air quality was provided during social events and also via brokerage event that was organized in May 30<sup>th</sup> evening.



**Figure 6.** Views from the ANVOC Symposium.



**Figure 7.** Views from the ANVOC Symposium.

## 2. DISSEMINATION AND USE

**Table 5.** Deliverable list.

| Del. no. | Deliverable name  | Workpackage no. | Date due | Actual/Forecast delivery date | Estimated indicative person-months *) | Used indicative person-months *) | Lead contractor |
|----------|---|-----------------|----------|-------------------------------|---------------------------------------|----------------------------------|-----------------|
| D1       | Reviewed abstracts  | 2               | M2       | M8                            | 0.80                                  | -                                | 1               |
| D2       | Reviewed and selected papers  | 2               | M4       | M9                            | 1.00                                  | -                                | 1               |
| D3       | Call for Papers – Brochure  | 3               | M1       | M5                            | 0.30                                  | -                                | 3               |
|          | Pocket Programme for delegates  |                 |          |                               |                                       |                                  |                 |
|          | Participation certificates  |                 |          |                               |                                       |                                  |                 |
|          | Questionnaire   |                 |          |                               |                                       |                                  |                 |
|          | Invitation cards for Symposium Dinner and also for Half Day City Tour |                 |          |                               |                                       |                                  |                 |
| D4       | Symposium Proceedings   | 3               | M7       | M11                           | 0.30                                  | -                                | 3               |
|          | CD-ROM of refereed papers   |                 |          |                               |                                       |                                  |                 |
| D5       | Website   | 3               | M1       | M5                            | 0.60                                  | -                                | 3               |
| D6       | Second Call for Papers  | 4               | M3       | M9                            | 0.50                                  | -                                | 4               |
| D7       | Press Releases  | 4               | M11      | M10                           | 1.40                                  | -                                | 2               |
|          | CD-ROM containing interview   |                 |          |                               |                                       |                                  |                 |
| D8       | Participation list  | 5               | M11      | M10-M11                       |                                       | -                                | 2               |
|          | Registration forms  |                 |          |                               |                                       |                                  |                 |
|          | Azonanoflyer  |                 |          |                               |                                       |                                  |                 |
| D9       | Final report  | 1               | M11      | M11                           | 0.62                                  | -                                | 1               |

**Green)** Additional deliverables produced during running of the project.

\*) if available.

**Table 6.** Milestone list.

| Milestone no. | Milestone name   | Workpackage no. | Date due | Actual/Forecast delivery date | Lead contractor |
|---------------|--|-----------------|----------|-------------------------------|-----------------|
| 1             | The Project Management Committee was established                                 | 1               | M0       | M0                            | 1               |
| 2             | The necessary steps for preparing the symposium were defined                     | 1               | M0       | M0                            | 1               |
| 3             | The Program Committee was established  | 2               | M0       | M0                            | 1               |
| 4             | The general outline of the symposium was defined                                 | 2               | M0       | M0                            | 1               |
| 5             | The Publication & Dissemination Committee was formed                             | 3               | M1       | M1                            | 3               |
| 6             | The website of ANVOC was created, implemented, and updated                       | 3               | M5       | M1                            | 3               |
| 7             | The proceedings of the ANVOC were published                                      | 3               | M10      | M6                            | 3               |
| 8             | The Publicity & Public Relation Committee was formed                             | 4               | M1       | M1                            | 4               |
| 9             | The scientists, researchers and membrane producers were informed about the ANVOC | 4               | M4-M5    | M1                            | 4               |
| 10            | The Local Arrangement Committee was established                                  | 5               | M5       | M5                            | 2               |
| 11            | The Symposium was implemented  | 5               | M10-M11  | M10                           | 2               |

The dissemination activities were controlled by the Project Management Committee. The Programme Committee reviewed the abstracts and selected the papers and notified the authors. The papers were printed in symposium proceedings and in CD-ROM by the Publication and Dissemination Committee. The symposium proceedings and the CD-ROM were distributed to the participants in symposium bags. Additionally, the proceedings were donated to the libraries of TUBITAK MRC, Istanbul Technical University and Kocaeli University.

The brochure of the ANVOC Symposium contains the information about the tentative agenda, highlights, events, the purpose of the symposium, accommodation, ANVOC website address, and was posted to the address of 314 (242 international and 72 national) potential participants including academicians, industrialists, researchers and students. The brochure has also been sent electronically via e-mail to almost 1000 related people.

The symposium program was prepared as web-version and also printed as pocket type for the delegates. The symposium program contains information about the sessions, session chairs, name of the authors and the presentations.

The Publication & Dissemination Committee prepared Participation Certificates to distribute to the delegates. The committee also prepared a questionnaire to get the idea, criticism and the recommendations of the participants about the symposium. This deliverable was commented and the results were given in previous section.

At the end of the symposium, The Publication & Dissemination Committee prepared a participant list containing the names, surnames, and contact info of the participants, and posted at the website.

The invitation cards for Symposium Dinner and also for Half Day City Tour were designed by the committee and were printed to distribute to the participants.

In order to provide the communication between project partners, to help the organization of the symposium and to disseminate the information and the outcomes of ANVOC such as papers, presentations, etc of the symposium to the participants as well as to the society and to the public the web infrastructure of ANVOC has been designed. The website address of ANVOC is as follows: <http://www.membrane.nl/anvoc2005>.

The second call for papers including the information about the symposium were distributed to the delegates via e-mail by The Publicity & Public Relation Committee.

The Press Release prepared by the Project Coordinator Dr. Ebru MEHMETLI in Turkish has been sent to the Turkish Press in May 2005. Another Press Release was prepared and was sent to the European Service Network, Belgium, which is a web-based press release for international release at the end of January 2005. Both Press Releases contains the information about the project, partners, objective, the target audience, EC support, topics, and the venue, and they have been enclosed within this report.

The ANVOC Symposium has been introduced to the Turkish people via one of the Turkish national TV channels (Technology Channel). An interview was done by the project coordinator Dr. Ebru MEHMETLI on February 11th 2005 in order to inform scientists, industrialists and the public about ANVOC, its content, importance, EU funding, the importance of recovery of VOCs, membrane systems, nanotechnology, etc. This interview was broadcasted on Thursday 24th, 2005. The copy of the program in a CD-ROM delivered from the TV channel including this interview has been enclosed to this report.

Registration forms were prepared to get participant profile and contact information. These forms were filled in by the participants on-line before the symposium was held and also filled on-site.

While the Publicity & Public Relation Committee applied to the websites to include the highlights of ANVOC Symposium in their Symposium Calendars/Diary Pages, and also to give a link to ANVOC website, the committee also applied to The Institute of Nanotechnology, Stirling, UK. After that, the committee was asked by the Institute of Nanotechnology to put some flyers out at the symposium or included in ANVOC delegate packs detailing some of the events and other ventures we are embarking upon this year. The committee accepted the institute's requirement and included the flyers in the delegate bags. The flyer received from the Institute of Nanotechnology is an additional deliverable of this work package.

The final report will be the final deliverable of this project.

## LIST OF ANNEXES

### ANNEX 1: RESPOND OF FONDATION D'ENTREPRISE TOTAL

Dear Mrs. Ebru Mehmetli,

I would like to thank you for your mail of 15 February about your project "Application of Nanotechnologies for Separation and Recovery of Volatile Organic Compounds from Waste Air Streams (ANVOC)", which we have read with great interest.

The Total Corporate Foundation is oriented towards the preservation of marine biodiversity and already involved in several projects, thus it is difficult for us, given current budget constraints, to further extend the scope of our efforts for the time being.

To our regret, we are therefore not in a position to participate in your project.

Yours sincerely,

Aurélien Vadier

Fondation d'entreprise Total

Ebru.Mehmetli@mam.gov.tr

15/02/2005

10:39

holding.fondation@total.com

Veillez répondre à

cc

Ebru.Mehmetli@mam.gov.tr

Objet Site Fondation d'entreprise Total :



Bonjour,

Mme EBRU MEHMETLI de la société/organisme The Scientific and Technical Research Council of Turkey, Marmara Reserach Center (TUBITAK MRC) vous soumet son projet Application of Nanotechnologies for Separation and Recovery of Volatile Organic Compounds from Waste Air Streams (ANVOC)

Coordonnées de l'organisme/société :

Nom de l'organisme/société : The Scientific and Technical Research Council of Turkey, Marmara Reserach Center (TUBITAK MRC)

Adresse : TUBITAK MRC, Institute of Chemistry and Environment, Gebze, 41470 Kocaeli, Turkey

Téléphone : +90 262 641 23 00 (Ext:3957)

Fax : +902626412309

Coordonnées de la personne responsable du projet : Mme EBRU MEHMETLI

Téléphone : +90 262 641 23 00 (Ext:3957)

Email :

Description du projet :

Intitulé du projet : Application of Nanotechnologies for Separation and Recovery of Volatile Organic Compounds from Waste Air Streams (ANVOC)

Contexte : Volatile Organic Compounds \"VOC's\" are among the most important chemicals used and emitted from the process industries. Recently, several environmental regulations have been enacted and they require industries to limit \"VOC's.\" Due to the significant economic and environmental implications of disposing of VOC's, much attention has been recently directed towards pollution-prevention techniques aimed at reducing VOC emissions from industrial facilities in a cost-effective manner. Membrane technology has many opportunities in this respect. Membrane systems offer lower costs, less maintenance, more flexibility, and significant environmental and product quality advantages than the conventional technologies and can be applied to a wide variety of industries. Membrane systems can perform difficult separations not possible with other technologies.

Objectif : The general objective of ANVOC is to enhance scientific understanding, performance, and engineering applications of membrane-based technological solutions and to address important pollution risk issues (e.g. removal of VOCs) that endanger human health

and the environment through the development, publication, and dissemination of high quality research data and outputs via a symposium that will be organized. Briefly, the ANVOC will: Provide experts come together to share and transfer their knowledge in this field of science and technology; Create a large group from Member States and CC institutions engaged in membrane technology; Show the R&D activities in this field and performing some of them; Identify and understand the use of different membrane materials in gas separation; Identify and understand the membrane types used for the recovery of VOC's.; Bring together a wide range of people from different sectors and backgrounds who have an interest in air quality; Create possibilities of launching new cooperation in this field; Disseminate the results obtained so far.

Méthodologie : ANVOC will present the latest developments in the area of systematically addressing VOC pollution prevention, an overview of pollution-prevention approaches, and membrane technologies for the VOC separation from gaseous wastes. Timely and effective technology transfer between the research centers, universities and their industrial participants will be provided. The pursuit of these objectives fosters increased research center-university-industry interactions. These interactions produce industrially relevant research results that can be implemented in a timely fashion. The experience that has been gained in this field will be spread through a symposium. Information dissemination, which is the outcome of the symposium will be performed via in print as proceedings and CD, and also through ANVOC website. <http://www.membrane.nl/anvoc2005> Delegates representing industry; local authorities; policy and regulatory government bodies and departments; non-governmental organizations; and researchers will be invited.

Durée : July 1, 2004 - June 31, 2005

Partenaires : ANVOC is an FP6 project, financially supported by EC. TUBITAK MRC is the project coordinator and the partners are: University of Twente - European Membrane Institute – EMI (UT-EMI), Netherlands; University of Chemical Technology and Metallurgy, Bulgaria; Kocaeli University, Turkey

Retour d'image et budget : The overall budget of ANVOC is 50.000 € (fifty thousand Euro). The consortium has committed to EC to contribute into the budget with 20.000 € to increase the quality of the symposium. This contribution was expected to provide from registration fees. However, not much participants have applied for pre-registration and abstract submission although the deadline was extended to March 1, 2005. Therefore, we have doubt to collect 20.000 € from registration fees. That's why we have decided to invite more (5-10) speakers to attract people and provide their participation. While I was browsing TOTAL

website to find corresponding address for e-mailing ANVOC brochure, I noticed \"Foundation Support for Scientific Projects\". I have decided to fill in this form and request for 10.000 € in order to invite more scientists to speak at the ANVOC Symposium. The flight tickets, accommodation, lunch through the symposium, a welcome dinner and half day old city tour will be spent from requested budget. If there is budget left, we will use it for other purposes to increase the quality of the symposium. The consortium will be grateful for your contribution and participation. Thank you very much for your consideration. Dr. Ebru MEHMETLI  
Coordinator, ANVOC

## ANNEX 2: BROCHURE

The original printed brochure has been enclosed to the report.

**ISTANBUL**

"There, God and human, nature and art are together, they have created such a perfect place that it is valuable to see." Lamartine's famous poetic line reveals his love for Istanbul, describing the embracing of two continents, with one arm reaching out to Asia and the other to Europe.

Istanbul, once known as the capital of capital cities, has many unique features. It is the only city in the world to straddle two continents, and the only one to have been a capital during two consecutive empires - Christian and Islamic. Once capital of the Ottoman Empire, Istanbul still remains the commercial, historical and cultural pulse of Turkey, and its beauty lies in its ability to embrace its contradictions. Ancient and modern, religious and secular, Asia and Europe, mystical and earthly all co-exist here.

Its variety is one of Istanbul's greatest attractions: The ancient mosques, palaces, museums and bazaars reflect its diverse history. The thriving shopping area of Taksim buzzes with life and entertainment. And the serene beauty of the Bosphorus, Princes Islands and parks bring a touch of peace to the otherwise chaotic metropolis.

<http://goturkey.kulturturizm.gov.tr/>

**Contact Address**  
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<http://www.membrane.nl/anvoc2005>

**First Announcement and Call for Papers for  
International Symposium**

**Application of Nanotechnologies  
for Separation and Recovery of Volatile Organic  
Compounds  
from Waste Air Streams**

**30 - 31 May, 1 June 2005**  
**Istanbul, Turkey**

**Organized by**  
The Scientific and Technical Research Council of Turkey  
Marmara Research Center (TUBITAK-MRC), Turkey  
Kocaeli University, Turkey  
University of Twente - EMI, Netherlands  
University of Chemical Technology and Metallurgy, Bulgaria



## INTRODUCTION

The general objective of ANVOC is to address the removal of volatile organic compounds, that lead to important pollution, from waste gas by membrane separation and to enhance scientific understanding, performance, and engineering application of membrane-based technological solutions in VOC recovery through dissemination of high quality research data. Briefly, the ANVOC will:

- Provide experts come together to share and transfer their knowledge in this field of science and technology,
- Create a large group engaged in membrane technology from Member States, Associated Candidate Countries and Candidate Countries in European Union,
- Show the R&D activities in this field,
- Identify and understand the use of different membrane materials in gas separation,
- Identify and understand the membrane types used for the recovery of VOC's.
- Bring together a wide range of people from different sectors and backgrounds who have an interest in air quality
- Create possibilities of launching new cooperation in this field,
- Disseminate the results obtained so far.

## CALL FOR PAPERS

Papers are invited on the topics outlined and others falling within the scope of the symposium. Abstracts of no more than 300 words should be submitted to the Scientific Advisory Committee before 31 January 2005. Detailed information is available at <http://www.membrane.nl/anvoc2005>.

## VENUE

Symposium will be held between 30 May - 1 June 2005 in Hilton Hotel Istanbul. Detailed information is available at <http://www.membrane.nl/anvoc2005>.

## SCIENTIFIC ADVISORY COMMITTEE

Ebru MEHMETLI  
TUBITAK - MRC, Turkey

Bilgin HILMIOGLU  
TUBITAK - MRC, Turkey

Nihfer HILMIOGLU  
Kocaeli University, Turkey

Nilgun AKIN  
Kocaeli University, Turkey

Geert-Henk KOOPS  
University of Twente - EMI, Netherlands

Antoine KEMPERMAN  
University of Twente - EMI, Netherlands

Vladimir Kozukharov  
University of Chemical Technology and Metallurgy, Bulgaria

Stephan Kozukharov  
University of Chemical Technology and Metallurgy, Bulgaria

## REGISTRATION

Early registration fee is 200 € for full participants and 100 € for students not later than 20 May 2005. Registration fee covers symposium proceedings, CD, welcome dinner, lunch and coffee breaks during the symposium, and symposium bag. Detailed information is available at <http://www.membrane.nl/anvoc2005>.

## SYMPOSIUM TOPICS

- Implementation of nanotechnologies in the field of VOC emission reduction,
- Available technologies for VOC separation and/or reduction in industry,
- Membrane systems for VOC separation from gaseous streams,
- VOC removal from organic vapor / air streams by membrane technologies,
- Estimation, simulation and mathematical modeling of VOC emission reduction by using membranes,
- VOC control by nanotechnologies: Current practices and future trends.
- Recovery / removal of VOCs from wastewater by membrane processes,
- Gas separation with membranes,
- The use of mixed matrix membranes
- Carbon membranes for gas and organics separation.

## IMPORTANT DAYS

- Submission of abstracts: **January 31, 2005**  
• Acceptance Notice: **February 28**  
• Submission of full manuscripts: **11 April**  
• End of early registration: **20 May**

## ACCOMMODATION

Provisional room reservations have been made at some hotels located close to the event at different rates for ANVOC participants. For further information please browse at the ANVOC website. <http://www.membrane.nl/anvoc2005>.

## SOCIAL ACTIVITY

A welcome dinner and a half day old city tour will be organized. Detailed information is available at <http://www.membrane.nl/anvoc2005>.

## PRE-REGISTRATION FOR ANVOC

Please do the on-line pre-registration and return it to contact address, and you will receive up dated information on ANVOC. Symposium announcements will be also sent to you at the address you would register.

Please add my name to your mailing list and send the next announcement to :

First Name :  
Last Name :  
Title :  Prof.  Dr.  Mr.  Ms.  
Affiliation (University/Company/etc.)  
Address :  
City :  
Zip Code :  
Country :  
Phone :  
Fax :  
E-mail :

I am interested in

- Attending  
 Sponsoring  
 Exhibition  
 Presenting papers (if yes, your tentative title would be.....).

### ANNEX 3: EVALUATION LIST OF THE REVIEWED ABSTRACTS

| Author          | Abstract Number | Title  | Presentation | Session          |
|-----------------|-----------------|--|--------------|------------------|
| V. Teplyakov    | ANVOC 01        | Design and study of an innovative hybrid membrane system for VOC's recovery from water   | oral         | 1                |
| V. Kozhukharov  | ANVOC02         | Current Status Of The Nanotechnologies And Their Impact On Membranes Science   | oral         | General Overview |
| A. Evcin        | ANVOC03         | Preparation Of Zeolite-Filled Polymeric Membranes For Pervaporation  | poster       | poster           |
| S. Kozhukharov  | ANVOC04         | Innovative Aspects Regarding Membranes For Gas Separation: Patents State-Of-The-Art  | poster       | poster           |
| S. Kozhukharov  | ANVOC05         | Synthesis and Development of Photoactive Membranes for Decomposition of Volatile Organic Compounds   | oral         | 1                |
| R.K. Jayakumar  | ANVOC06         | Separation of VOC's By Sewage Sludge Adsorbent- A Cost Effective Method  | poster       | poster           |
| Frederic Heymes | ANVOC07         | Voc Removal From Gaseous Emissions By A Hybrid Process: Absorption And Pervaporation   | oral         | 1                |
| P. Uchytíl      | ANVOC08         | Transport mechanism in polyethylene membrane during vapor permeation of propan-1-ol and toluene  | oral         | 1                |
| E.K. Solak      | ANVOC09         | Separation Characteristics of Dimethylformamide/Water mixtures through alginate membranes by Pervaporation, Evaporation and Temperature-Difference Evaporation | poster       | poster           |

| Author          | Abstract Number | Title   | Presentation | Session |
|-----------------|-----------------|---|--------------|---------|
| N. Uğur         | ANVOC10         | Determining Volatile Organic Compounds (Vocs) Using Qcm Based Chemical Sensor Array   | oral         | 3       |
| M. Ivanova      | ANVOC11         | Zeolite Membranes: On Their Performance And Contribution To The Environmental Problems Solution   | poster       | poster  |
| A. Kharitonov   | ANVOC12         | Direct Fluorination And Direct Fluorination Accompanied With A Grafting - Useful Tool To Enhance Separation Properties Of Polymeric Membranes | oral         | 4       |
| T. Kaweeterawat | ANVOC13         | High Surface Area Nano-Material For Gas Pollution Monitoring  | oral         | 3       |
| K.K. Sirkar     | ANVOC14         | Removal Of Vocs From Air Streams Using Membrane Technologies  | oral         | 2       |
| T. Gerganova    | ANVOC15         | Structure-Properties Relationship Of Sio <sub>2</sub> -Based Organic-Inorganic Hybrid Membranes   | poster       | poster  |
| M. Peker        | ANVOC16         | A Man Portable GC/MS For The Analysis Of Volatile Organic Compounds   | poster       | poster  |
| B. Topuz        | ANVOC17         | Effects Of Processing On The Properties And Permeability Of Pure Gases Through Sol-Gel Derived Ceramic Membranes                              | oral         | 4       |
| A. Babaluo      | ANVOC18         | Manufacturing Of Alumina-Ceria Nanocomposite Membranes For Removing Of Volatile Organic Compounds   | oral         | 1       |
| Y. Yıldırım     | ANVOC19         | Catalytic Combustion Of O-Xylene In A Knudsen Controlled Catalytic Membrane Reactor   | oral         | 1       |
| N. Hilmioğlu    | ANVOC20         | Pervaporative Separation Of Methyl Tert Buthyl Ether From Wastewater  | poster       | poster  |

| Author         | Abstract Number | Title  | Presentation | Session |
|----------------|-----------------|--|--------------|---------|
| L. Yılmaz      | ANVOC21         | Past Developments And Future Directions In Development Of Glassy Polymer/Filler Mixed Matrix Membranes   | oral         | 2       |
| H. Kalıpçılar  | ANVOC22         | Research On Zeolite Membranes In Chemical Engineering<br>Department Of Middle East Technical University  | oral         | 2       |
| H. Doğan       | ANVOC23         | Development Of Regenerated Cellulose Membranes For Pervaporative Separation Of Dmc/Methanol/Water Mixture  | oral         | 2       |
| D. Şen         | ANVOC24         | Effect Of Compatibilizers On The Development Of Polymer-Zeolite Mixed Matrix Gas Separation Membranes  | oral         | 2       |
| Ç. Oral        | ANVOC25         | Study Of The Zeolite-Polymer Interphase In Mixed-Matrix Composite Gas Separation Membranes   | oral         | 2       |
| I. Ağıl        | ANVOC26         | Polymer-Zeolite Nanocomposite Gas Separation Membranes   | poster       | poster  |
| Ş. Deniz       | ANVOC27         | Sorption Behavior Of Poly (Urethane-B-Methacrylate) Membranes Prepared From 4,4'-Diphenylmethane Diisocyanate Using Polyurethane Based Macroazoinitiators In Ethyl Alcohol-Water Mixture | poster       | poster  |
| F. Dinçer      | ANVOC28         | Removal Of Odourous Volatile Organic Compounds From Polluted Air By Biofilters   | oral         | 1       |
| Klaus Ohlrogge | ANVOC29         | Voc Separation From Off-Gas And Process Streams  | oral         | 1       |
| Richard Noble  | ANVOC30         | Use Of Room Temperature Ionic Liquids For Chemical Separations   | oral         | 4       |
| A. Kemperman   | ANVOC31         | Ag-Functionalized Carbon Membranes For Gas Separation  | oral         | 4       |



| <b>Author</b> | <b>Abstract Number</b> | <b>Title</b>  | <b>Presentation</b> | <b>Session</b> |
|---------------|------------------------|---|---------------------|----------------|
| H. Richter    | ANVOC 33               | Microporous Ceramic Membranes for Liquid Filtration and Pervaporation in Water and Organic Solvents | oral                | 2              |
| M. Pina       | ANVOC 32               | Catalytic membranes for VOCs removal  | oral                | 1              |

#### **ANNEX 4: SYMPOSIUM PROCEEDINGS**

ANVOC Symposium Proceedings are only available in hardcover book, and has been enclosed to the report.

#### **ANNEX 5: SYMPOSIUM PROCEEDINGS IN CD-ROM**

CD-ROM which contains symposium proceedings has been enclosed to the report.

#### **ANNEX 6: SYMPOSIUM PROGRAMME**

The original printed version of the symposium program has been enclosed to the report. The picture format of the symposium program is illustrated below.

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| Symposium Program  |   | WEDNESDAY, JUNE 1ST                   |
|--|---|---------------------------------------|
| <b>SESSION 3</b>   | <b>Gas Separation</b>   | <b>Chair Person: Kamallesh Sircar</b> |
| 09:00-09:40  | <b>KEYNOTE LECTURE</b><br><b>Richard D. Noble</b> (University of Colorado, USA)<br>Ionic Liquids in Stable Membranes for Gas Separations                              |                                       |
| 09:40-10:10  | <b>Antoine Kemperman</b> (Univ. of Twente-EMI, Netherlands)<br>Ag-Functionalized Carbon Membranes for Gas Separation  |                                       |
| 10:10-10:40  | <b>Alexander Khanitov</b> (Inst. of En. Prob. of Chem. Phys. RAS, Russia)<br>Direct Fluorination- Useful Tool to Enhance Separation Properties of Polymeric Membranes |                                       |
| <b>10:40-11:00</b>   | <b>Coffee Break</b>   |                                       |
| 11:00-11:30  | <b>Berna Topuz</b> (Lumir Inst. of Tech., Turkey)<br>Effects of Processing on the Properties and Permeability of Pure Gases Through Sol-gel Derived Ceramic Membranes |                                       |
| 11:30-11:45  | Closure   |                                       |
| <b>12:00-13:00</b>   | <b>Lunch</b>  |                                       |
| <b>13:00-</b>  | <b>City Tour</b>  |                                       |
| <b>POSTERS</b>   |   |                                       |
| <b>I. Ağıl (ITU, Turkey)</b><br>Polymer-Zeolite Nanocomposite Gas Separation Membranes   |   |                                       |
| <b>S. Kozulharov (UCTM, Bulgaria)</b><br>Innovative Aspects Regarding Membranes for Gas Separation: Patents State-of-the-Art   |   |                                       |
| <b>Ş. Deniz (Göktürk Technical Univ., Turkey)</b><br>Sorption Behavior of Poly (Urethane-B-Methacrylate) Membranes Prepared From 4,4'-Diphenylmethane Diisocyanate Using Polyurethane Based Macroamplifiers in Ethyl Alcohol-Water Mixture |   |                                       |
| <b>A. Evcin (Aydın Kocatepe Univ., Turkey)</b><br>Preparation of Zeolite-filled Polymeric Membranes for Pervaporation  |   |                                       |
| <b>R.K. Jayalumar (Anna Univ., India)</b><br>Separation of VOC's By Sewage Sludge Adsorbent- A Cost Effective Method   |   |                                       |
| <b>E.K. Solak (Gazi Univ., Turkey)</b><br>Separation Characteristics of Dimethylformamide/Water Mixtures Through Alginate Membranes by Pervaporation, Evaporation and Temperature-Difference Evaporation                                   |   |                                       |
| <b>M. Bekar (Istanbul Univ., Turkey)</b><br>A Mini Portable GC/MS for the Analysis of Volatile Organic Compounds   |   |                                       |
| <b>T. Gerganova (UCTM, Bulgaria)</b><br>Structure-Properties Relationship of SiO <sub>2</sub> -Based Organic-Inorganic Hybrid Membranes  |   |                                       |
| <b>N. Hilmioğlu (KOU, Turkey)</b><br>Pervaporative Separation of Methyl Tert. Butyl Ether from Wastewater  |   |                                       |
| <b>M. Ivanova (UCTM, Bulgaria)</b><br>Zeolite Membranes: On Their Performance and Contribution to the Environmental Problems Solution  |   |                                       |

□

## ANVOC SYMPOSIUM PROGRAM



### Application of Nanotechnologies for Separation and Recovery of Volatile Organic Compounds from Waste Air Streams

30 – 31 May, 1 June 2005  
Istanbul, Turkey

Sponsored by



Supported by



Organized by  
The Scientific and Technical Research Council of Turkey  
Marmara Research Center (TUBITAK-MRC), Turkey  
Kocaeli University, Turkey  
University of Twente – EMI, Netherlands  
University of Chemical Technology and Metallurgy, Bulgaria





| Symposium Program  |  | MONDAY, MAY 30TH |
|--------------------|--|------------------|
| 08:00-09:30        | Registration   |                  |
| 09:30-09:50        | Opening Ceremony   |                  |
|                    | <b>Assoc. Prof. Dr. Mustafa Tims</b><br>TUBITAK MRC, Director of CEL, Turkey   |                  |
|                    | <b>Dr. Ebru Mehmetli</b><br>TUBITAK MRC, Coordinator of ANVOC, Turkey  |                  |
| 09:50-10:20        | <b>General Overview</b><br>V. Kozhukharov (UCTM, Bulgaria)<br>Current Status of the Nanotechnologies and Their Impact on Membranes Science                             |                  |
| <b>SESSION 1</b>   | <b>VOC Separation</b><br><i>Chair Person: Richard D. Noble</i>   |                  |
| 10:20-11:00        | <b>KEYNOTE LECTURE</b><br><b>Klaus Ohligge</b> (GKSS-Forschungszentrum Geesthacht GmbH, Germany)<br>VOC Separation from Off-Gas and Process Streams                    |                  |
| <b>11:00-11:30</b> | <b>Coffee Break</b>  |                  |
| 11:30-12:00        | <b>Ali Akbar Babaei</b> (Sahand University of Technology, Iran)<br>Manufacturing of Alumina-Ceria Nanocomposite Membranes for Removing of Volatile Organic Compounds   |                  |
| 12:00-12:30        | <b>Elaç İmra</b> (Univ. of Zaragoza)<br>Catalytic membranes for VOCs removal   |                  |
| <b>12:30-14:00</b> | <b>Lunch</b>   |                  |
| 14:00-14:30        | <b>Petr Uchytel</b> (Acad. of Sciences of the Czech Republic, CR)<br>Transport Mechanism in Polyethylene Membrane During Vapor Permeation of Propan-1-ol and Toluene   |                  |
| 14:30-15:00        | <b>Vladimir Teplov</b> (A. N. Topchiev Inst. of Petrochemical Synth., Russia)<br>Design and Study of an Innovative Hybrid Membrane System for VOCs Recovery from Water |                  |
| 15:00-15:30        | <b>Yılmaz Yıldırım</b> (Karadeniz Tech. Univ., Turkey)<br>Catalytic Combustion of O-Xylene in a Knudsen Controlled Catalytic Membrane Reactor                          |                  |
| <b>15:30-16:00</b> | <b>Coffee Break</b>  |                  |
| 16:00-16:30        | <b>Fredric Heynes</b> (L'GEL, France)<br>VOC Removal from Gaseous Emissions by a Hybrid Process : Absorption and Pervaporation   |                  |
| 16:30-17:00        | <b>Stephan Kozhukharov</b> (UCTM, Bulgaria)<br>Synthesis and Development of Photoactive Membranes for Decomposition of Volatile Organic Compounds                      |                  |
| 17:00-17:30        | <b>Faruk Dincer</b> (Dokuz Eylül Univ., Turkey)<br>Removal of Odorous Volatile Organic Compounds From Polluted Air by Biofilters                                       |                  |

| Symposium Program  |  | TUESDAY, MAY 31ST |
|--------------------|--|-------------------|
| 09:00-09:20        | <b>Fredric Goardere</b><br>EC Research Directorate-General, Belgium  |                   |
| <b>SESSION 2</b>   | <b>Membrane Systems, Mixed Matrix Membranes</b><br><i>Chair Person: Klaus Ohligge</i>  |                   |
| 09:20-10:00        | <b>KEYNOTE LECTURE</b><br><b>Kamlesh K. Sirkar</b> (NI Institute of Technology, USA)<br>Removal of VOCs from Air Streams Using Membrane Technologies                             |                   |
| 10:00-10:30        | <b>Levent Yılmaz</b> (METU, Turkey)<br>Past Developments and Future Directions in Development of Glassy Polymer/Filler Mixed Matrix Membranes                                    |                   |
| <b>10:30-11:00</b> | <b>Coffee Break</b>  |                   |
| 11:00-11:30        | <b>Hannes Richter</b> (Harmsdorfer Inst. für Tech. Keramik e.V., Germany)<br>Microporous Ceramic Membranes for Liquid Filtration and Pervaporation in Water and Organic Solvents |                   |
| 11:30-12:00        | <b>Çiğdem Oral</b> (ITU, Turkey)<br>Study of the Zeolite-Polymer Interphase in Mixed-Matrix Composite Gas Separation Membranes   |                   |
| 12:00-12:30        | <b>Habib Kılıçpınar</b> (METU, Turkey)<br>Research on Zeolite Membranes in Chemical Engineering Department of Middle East Technical University                                   |                   |
| <b>12:30-14:00</b> | <b>Lunch</b>   |                   |
| 14:00-14:30        | <b>Hacer Doğan</b> (TUBITAK MRC, Turkey)<br>Development of Regenerated Cellulose Membranes for Pervaporative Separation of DMC/Methanol/Water Mixture                            |                   |
| 14:30-15:00        | <b>Değer Şen</b> (METU, Turkey)<br>Effect of Compatibilizers on the Development of Polymer-Zeolite Mixed Matrix Gas Separation Membranes   |                   |
| <b>SESSION 3</b>   | <b>Available Technologies</b><br><i>Chair Person: Vladimir Kozhukharov</i>   |                   |
| 15:00-15:30        | <b>Neşin Uğur</b> (TUBITAK MRC, Turkey)<br>Determining Volatile Organic Compounds (VOCs) Using QCM Based Chemical Sensor Array   |                   |
| 15:30-16:00        | <b>Thanayuth Kawesterawat</b> (Petroleum and Petrochemical College, Thailand)<br>High Surface Area Nano-Material For Gas Pollution Monitoring                                    |                   |
| <b>16:00-17:30</b> | <b>Coffee Break and Posters Round Tours</b>  |                   |
|                    |  |                   |
| <b>20:00 -</b>     | <b>Symposium Dinner</b>  |                   |

**ANNEX 7: PARTICIPATION CERTIFICATES**

The original printed version of the participation certificate has been enclosed to the report.

**THE SCIENTIFIC AND TECHNICAL RESEARCH COUNCIL OF TURKEY  
MARMARA RESEARCH CENTER**

**CERTIFICATE OF PARTICIPATION**

This is to certify that

**EBRU MEHMETLI,**  
has attended to Symposium on

**Application of Nanotechnologies for Separation and Recovery of Volatile Organic  
Compounds from Waste Air Streams (ANVOC)**

held on

May 30th – June 1st, 2005  
Istanbul, TURKEY





*Prof.Dr. Önder YETİŞ*  
*President*  
*TÜBİTAK-Marmara Research Center*

## ANNEX 8: QUESTIONNAIRE

| QUESTIONNAIRE for ANVOC   |                  |           |          |             |          |
|---|------------------|-----------|----------|-------------|----------|
|   | Highly Satisfied | Satisfied | Adequate | Unsatisfied | COMMENTS |
| 1. Novelty of the topics and technologies?  |                  |           |          |             |          |
| 2. Are you satisfied with the knowledge you have gained during the symposium?                             |                  |           |          |             |          |
| 3. Are you likely to apply what you have learnt during the course of your activities?                     |                  |           |          |             |          |
| 4. Do you think this symposium contributed to initiate new professional relationship in your area?        |                  |           |          |             |          |
| 5. How was the contribution of the social activities as a platform to discuss professional opportunities? |                  |           |          |             |          |
| 6. Was the distribution of the presentations versus sessions reasonable?                                  |                  |           |          |             |          |
| 7. The content of the presentations?  |                  |           |          |             |          |
| 8. The academic worth of the presentations?   |                  |           |          |             |          |
| 9. Symposium facilities?  |                  |           |          |             |          |
| 10. Any points you would like to comment on?  |                  |           |          |             |          |
| THANK YOU...  |                  |           |          |             |          |

## ANNEX 9: INVITATION CARDS

The original printed version of the invitation cards have been enclosed to the report. The picture format of the invitation cards are illustrated below.

|  |   |   |
|--|---|---|
| <p><b>TÜBİTAK</b><br/>Türkiye Bilimsel ve Teknik Araştırma Kurumu<br/>Marmara Araştırma Merkezi Başkan Vekili<br/><b>Önder YETİŞ</b></p> <p><i>ANVOC</i><br/><i>Sempozyumunun</i><br/><i>31 Mayıs 2005 akşamı düzenlenecek</i><br/><i>yemeğini onurlandırmanızı saygılarımla</i><br/><i>diler.</i></p> <p><i>Kız Kulesi</i><br/><i>Üsküdar / İstanbul</i></p> <p><b>Ulaşım</b><br/><i>Otobüs Kalkış:19:00 Hilton Hotel - Kabataş</i><br/>Tekne Kalkış:19:30 Kabataş – Kız Kulesi</p> | <p></p> <p>Application of Nanotechnologies for<br/>Separation and Recovery of Volatile<br/>Organic Compounds from<br/>Waste Air Streams</p> <p> </p> <p>    </p> | <p><b>TUBİTAK</b><br/>Marmara Research Center Acting President<br/><b>Önder YETİŞ</b></p> <p><i>Requests the honor of your presence at</i><br/><i>ANVOC Symposium</i><br/><i>Dinner to be held on</i><br/><i>May 31st, 2005</i></p> <p><i>Maiden's Tower</i><br/><i>Uskudar /Istanbul</i></p> <p><b>Transportation</b><br/><i>Bus Departure:19:00 Hilton Hotel – Kabataş</i><br/><i>Boat Departure : 19:30 Kabataş – Kız Kulesi</i></p> |
|--|---|---|

**KIZ KULESİ  
SEMPOZYUM YEMEĞİ MENÜSÜ**

*Enginar Göbeğinde Karides Kokteyl  
Hamsi Salamura, Acılı Ezme  
Tulum Peyniri, Beyaz Peynir  
Yaprak Sarma, Patlıcan Salatası  
Ispanaklı Piliç Bonfilesi*

+++++  
*Kışlören, Ekşi Krema Sos ve Yeşillikler  
Eşliğinde*

+++++  
*Pazı ile doldurulmuş zeytin soslu tavuk  
bonfile*

+++++  
*Brownie*

+++++  
*Limitsiz Yerli İçki*



Application of Nanotechnologies for  
Separation and Recovery of Volatile  
Organic Compounds from  
Waste Air Streams



**MAIDEN'S TOWER  
SYMPOSIUM DINNER MENUE**

*Prawn Cocktail Served Artichoke  
Brined Anchovies, Spicy Tomato Dip  
Tulum Cheese, Feta Cheese  
Stuffed Vine Leaves with Olive Oil  
Aubergine Salad, Chicken Steak  
with Spinach*

+++++  
*Quiche Lorraine Served with by Sour  
Cream Sauce and Fresh Green Leaves*

+++++  
*Grilled chicken breast stuffed with chard  
served with olive sauce*

+++++  
*Brownie*

+++++  
*Unlimited Domestic Spirits*



**TÜBİTAK MAM  
YARIM GÜNLÜK  
ŞEHİR TURU**

**Hareket Yeri : HİLTON HOTEL  
TAKSİM**

**Hareket Tarihi : 01 HAZİRAN 2005**

**Hareket Saati : 13:15**

**Gezilecek  
Yerler : AYASOFYA MÜZESİ  
TOPKAPI SARAYI  
SULTANAHMET  
CAMİİ**



**Application of Nanotechnologies for  
Separation and Recovery of Volatile  
Organic Compounds from  
Waste Air Streams**



**TUBITAK MRC  
HALF DAY ISTANBUL  
CITY TOUR**

**Departure : HILTON HOTEL  
TAKSİM**

**Departure  
Date : June 1st, 2005**

**Departure  
Time : 13:15**

**Visiting  
Places : ST. SOPHIA  
TOPKAPI PALACE  
BLUE MOSQUE**

#### **ANNEX 10: CD-ROM (TECHNOLOGY CHANNEL)**

CD-ROM, which contains the interview realized by Turkish Technology Channel about ANVOC Symposium, has been enclosed to the report.

#### **ANNEX 11: PRESS RELEASE**

The press release sent to Turkish Press and sent to the European Service Network, Belgium have been enclosed to the report.

## ANNEX 12: PARTICIPATION LIST

| No | Name        | Surname           | Organization                    | Country         | Phone             | Fax               | e-mail                         |
|----|-------------|-------------------|---------------------------------|-----------------|-------------------|-------------------|--------------------------------|
| 1  | Alexander   | Kharitonov        | Russian Academy of Sciences     | Russia          | +7 916 6801645    | +7 916 6803573    | khariton@binep.ac.ru           |
| 2  | Ali         | Çulfaz            | METU                            | Turkey          | 0312 2102611      | 0312 2101264      | culfaz@metu.edu.tr             |
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| No | Name         | Surname     | Organization                        | Country  | Phone            | Fax             | e-mail                                  |
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## ANNEX 13: REGISTRATION FORM

### REGISTRATION FORM for ANVOC

I want to register for ANVOC Symposium in Istanbul on 30 May – 1 June 2005

|                                    |   |
|------------------------------------|---|
| Title:                             | <input type="checkbox"/> Prof. <input type="checkbox"/> Dr. <input type="checkbox"/> Mr. <input type="checkbox"/> Mrs. <input type="checkbox"/> Ms. |
| First Name:                        |   |
| Last Name:                         |   |
| Organization:                      |   |
| Department:                        |   |
| Address:                           |   |
| Postal Code / Zip:                 |   |
| Country:                           |   |
| Phone:                             |   |
| Fax:                               |   |
| E-mail:                            |   |
| Name(s) of Accompanying Person(s): |   |

#### I intent to participate in the symposium:

without presentation

with presentation

|                              |  |
|------------------------------|--|
| <b>Title Of Presentation</b> |  |
| <b>Author(s)</b>             |  |
| <b>Oral Presentation</b>     | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| <b>Poster Presentation</b>   | <input type="checkbox"/> Yes <input type="checkbox"/> No |

#### Registration Fees \*

| Registration Fees * | On-line<br>(through 23 May) | On-site<br>(30-31 May)                              |
|---------------------|-----------------------------|---|
| Full Participant    | <i>Euro 200</i>             | <input type="checkbox"/> <i>Euro 250</i>            |
| Student **          | <i>Euro 100</i>             | <input checked="" type="checkbox"/> <i>Euro 125</i> |
| Accompanying Person | <i>Euro 50</i>              | <input checked="" type="checkbox"/> <i>Euro 75</i>  |
| <b>TOTAL</b>        |                             | <i>Euro.....</i>                                    |

(\*) Registration fees include 18% VAT.

(\*\*) Please show your student identity card.

#### Payment Details

All amounts are payable in Euro (EUR).

|  |
|--|
| <b>DECLARATION</b>   |
| <input type="checkbox"/> I have read and understood the conditions of registration |

## **ANNEX 14: AZONANOFLYER**

The Azonano-flyer has been enclosed to the report.

## **ANNEX 15: BRIEF REPORTS OF THE INVITED KEYNOTE SPEAKERS ABOUT ANVOC SYMPOSIUM**

The originals of the reports have been enclosed to the report.

From: Prof. Richard D. Noble [Nobler@colorado.edu]  
Sent: Çarşamba 08 Haziran 2005 23:31  
To: Ebru Mehmetli  
Subject: Re: ANVOC

Ebru,

Thanks for your assistance. I am attaching a brief report that summarizes the meeting and outcomes.

Rich

Richard D. Noble  
Alfred T. & Betty E. Look Professor  
University of Colorado  
Chemical Engineering Dept.  
UCB 424  
Boulder, CO 80309  
Phone: (303)492-6100 FAX:(303)492-4637

June 8, 2005

Report for ANVOC Symposium Program  
Application of Nanotechnologies for Separation and Recovery of Volatile Organic Compounds from Waste Air Streams

The meeting was held in Istanbul, Turkey from May 30 to June 1, 2005. The meeting program included three keynote lectures, 20 oral presentations and 10 posters. The meeting presentations covered a wide range of topics with a strong focus on various membrane technologies.

An important aspect of the meeting was for researchers from Turkey, the European Union and the United States to present their work and share discussions on this topic. Also, a meeting of key individuals chaired by Dr. Mehmetli was conducted to discuss possible collaborations and funding opportunities.

A key outcome of the meeting was the interaction of the various participants. This interaction will serve as an excellent basis for future cooperation.

Richard D. Noble  
Alfred T. And Betty E. Look Professor Of Chemical Engineering  
University Of Colorado

MSJ-10915



GKSS-Forschungszentrum Geesthacht GmbH  
Postfach 1160 · 21494 Geesthacht · Deutschland

**TÜBITAK**  
**Marmara Research Center**  
**Institute of Chemistry and Environment**  
**Dr. Ebru Mehmetli**  
**P.O.Box 21**  
**41470 Gebze, Koceali**  
**Turkey**

**Institut für Chemie****Prof. Dr. Volker Abetz**  
**Prof. Dr. Andreas Lendlein**

Max-Planck-Straße 1  
21502 Geesthacht · Deutschland  
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Fax-Zentrale: 04152/87-1403  
Internet: www.gkss.de

| Ihr Zeichen/Ihre Nachricht | Unser Zeichen                | Durchwahl/Telefon:       | Durchwahl Telefax:       | Datum             |
|----------------------------|------------------------------|--------------------------|--------------------------|-------------------|
|                            | <b>CVT-Oh/Kr</b>             | 04152/87-<br><b>2400</b> | 04152/87-<br><b>2444</b> | <b>06.06.2005</b> |
|                            | <b>klaus.ohlogge@gkss.de</b> |                          |                          |                   |

Dear Dr. Mehmetli,

Thank you for organizing the ANVOC symposium and the great hospitality during the time in Istanbul.

The symposium was well structured and the list of speakers represents a good mixture of established and young scientists. I appreciate very much that the presentations were concentrated in only one session a day. All participants could concentrate on the announced presentations. We had enough time for discussions after the lectures and during coffee and lunch breaks. The location of the symposium was beautiful and we have enjoyed the excellent service. Another highlight was the symposium dinner. This also provides an additional opportunity for discussions and creating new contacts. The poster session was well accepted as opportunity for information exchange and lively discussions were generated.

It could improve further symposiums if more companies could be encouraged to participate in such a meeting. It might be helpful if one session will be addressed to emission problems of special industrial sectors like chemical industry, pharmaceutical industry, food industry, petroleum industry, automotive industry or others.

To underline the oral presentations the speakers should also present a poster in addition to their lectures.

I thank you for all efforts to organize a fruitful meeting which could be a nucleus for new cooperation.

Kind regards,

Klaus Ohlogge

Mitglied der Hermann von Helmholtz-Gemeinschaft Deutscher Forschungszentren e.V.

Rechtsform: Gesellschaft mit beschränkter Haftung · Sitz in Geesthacht · Amtsgericht Geesthacht · HRB 285 · Ust-IdNr.: DE 135 131 669  
Vorsitzender des Aufsichtsrates: Ministerialdirigent Hartmut Grübel · Geschäftsführer: Prof. Dr. Wolfgang A. Kaysser, Dipl.-Ing. Michael Ganß  
Die Zentralabteilungen und Institute besitzen keine eigene Rechtspersönlichkeit. Sie sind Organisationseinheiten des GKSS-Forschungszentrums  
Banken: Commerzbank 84 79 008 (BLZ 200 400 00) · Deutsche Bank 58 00 404 (BLZ 200 700 00) · Dresdner Bank 172 90 19 (BLZ 200 800 00)





## **ANNEX 16: ACKNOWLEDGEMENTS OF THE PARTICIPANTS.**

From: Frederic Heymes [frederic.heymes@ema.fr]  
Sent: Salı 07 Haziran 2005 11:21  
To: anvoc  
Subject: Aknowledgement

I wanted to thank you for the good organization of the conference which took place in Istanbul.  
I linked interesting professional relationships and was really happy to do my first oral presentation at ANVOC 2005 !  
Best regards,

Frédéric HEYMES  
Enseignant Chercheur  
Equipe risques industriels et naturels  
Ecole des Mines d'Alès  
Tel : 04.66.78.27.29  
Fax : 04.66.78.27.01

From: ealper@hacettepe.edu.tr  
Sent: Cuma 03 Haziran 2005 09:03  
To: Ebru Mehmetli  
Subject: Kime: ANVOC

Sayın Dr.Ebru Mehmetli,

Basarılı gecen ANVOC için bir kez daha tesekkür eder ve tebrik ederim. Basarılarınızın devamını dilerim.

Prof.Dr.Erdoğan Alper

Kimya Müh.Bölüm Başkanı

From: erdol@itu.edu.tr  
Sent: Pazartesi 06 Haziran 2005 07:44  
To: Ebru Mehmetli

Sevgili Ebru,

ANVOC Sempozyumu davetin için çok teşekkür ediyorum. Organizasyonundaki başarın için de tebrik ederim. Herşey çok güzeldi. Sevgilerimle,

Nalan ERDÖL AYDIN  
İTÜ

From: Cveti Gerganova [c\_gugy79@abv.bg]  
Sent: Cumartesi 04 Haziran 2005 00:20  
To: Ebru Mehmetli  
Subject: BG with kind regards

Dear Dr. Mehmetli,  
I would like to sincerely thank you for your kind attention and for the received hospitality. It was wonderful time at this meeting. I am looking forward to see you in Bulgaria.

Best regards,  
Tsvetelina Gerganova  
UCTM-Sofia