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Editorial

Workshop on catalytic technologies for environmentally benign processes

Geographic proximity, cultural affinity and mutual economic benefits lead to ever closer interdependence between North and South America, including strong partnerships in Chemical Engineering education, research, technology and development. On the basis of this idea, the Chemical Engineering Pan American Collaboration (CEPAC) was established on August 1998. Four major research areas in Chemical Engineering were identified: separations, thermodynamics, and interfacial science; catalysis and reaction engineering; process systems engineering; and biotechnology.

The mission of CEPAC is to develop a framework with specific mechanisms that:

- encourage the establishment;
- support the continuation;
- enhance the effectiveness of partnerships among Chemical Engineering academic institutions and industrialists of North and South America.

Some of the opportunities that motivated the creation of CEPAC are the following:

- South America is an area of significant growth with great capital investment by the US chemical, petroleum, food, mineral and manufacturing industries. This economic interest will grow further as we move into the 21st century.
- The increase of trade within the Mercosur countries establishes a good environment for joint programs. The inclusion of Venezuela, Peru and USA on these programs could be a seed for ALCA implementation.
- There are cultural links and English is a common language among chemical engineers both in academia and industry. Likewise Spanish is becoming an important cultural factor and it is a common second language taught at high school level in US.
- In South America there is a long history of education in Chemical Engineering and most departments have faculty with advanced degrees (many from US) that are active in research. There are several research centers with state of the art facilities and skilful professionals that conduct research of the same caliber than in similar international institutions (process systems, catalysis, biotechnology, computer science, fine chemicals, minerals, etc.).
- There are industrial research centers that have developed novel native processes in response to the local needs.
- There are also well-established funding agencies and mechanisms for funding research both academic as well as for R & D (CNPq, CONICET, CONYCIT, FINEP, NSF, etc.).

Among the potential benefits that the participants envisioned in the promotion of this Pan American collaboration can be listed as follows:

- Strengthening the ties between US and South America will accelerate north–south economic growth.
- Joint collaborations will help to enhance cultural links and understanding among participants.
- Increasing the number of researchers participating in collaborative programs from South America in US will provide the skilled personnel to conduct research both in US and in South America. These researchers, when returning to academia, will benefit the local industry by training skilled professional needed to sustain their operation and grow and by creating new knowledge.
- The participation of US researchers in collaborative projects in South America will increase the awareness of the research capabilities existing in South America. Collaborations will help to solve

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problems of common scientific and technological interest (e.g. environmental problems). It can also create awareness about problems that might not be well known in US.
- Collaborations can reduce the cost of research (50% for ACEP) by sharing facilities and experimental techniques and computational resources and skills that can be complementary to research programs both in US and South America.

The resulting CEPAC organization was established to overlook and implement the strategic plan and recommendations that emerged from the workshop. One of the recommendations of CEPAC was the organization of topical workshops. The workshop on *Catalytic Technologies for Environmentally Benign Processes* was a direct result of that recommendation.

The workshop on Catalytic Technologies for Environmentally Benign Processes took place in Santa Fe, Argentina, in 2–3 September 1999. This workshop was organized by Carlos Apesteguia from INCAPE (Santa Fe), and Daniel E. Resasco from the University of Oklahoma. In addition, a parallel workshop on Process Systems Engineering simultaneously took place in the same city. The organizers for that workshop were Ignacio Grossman from Carnegie Mellon University and Jaime Cerda, from INTEC, Santa Fe.

The two workshops were organized on occasion of the 80th anniversary of the Department of Chemical Engineering at the Universidad del Litoral in Santa Fe. The two workshops were in the areas of catalysis and process systems engineering, two areas of traditional strength in Argentina, particularly through its research institutes, INCAPE, INTEC, INGAR, and PLAPIQUI.

The workshop on catalysis focused in the areas of Environmental Catalysis and Environmentally Benign Catalytic Technologies. A total of 26 active participants from US, Argentina, Brazil and Chile took part in the event. The major goals of the workshop were the following:

1. to present current trends in research in the various countries;
2. to identify areas of common interest that may give rise to joint projects.

To ensure these goals, all the participants were asked to include in the abstract of the presentation a statements indicating the collaboration opportunities. The area of heterogeneous catalysis is perhaps one of the most highly developed research fields in Chemical Engineering in South America. This development has been particularly strong in Argentina and Brazil. The quality and breadth of the contributions presented by the South American participants, clearly reflected the high level of the research conducted in these countries. The technical topics covered during the workshop included:

1. In the area of catalysis for gaseous emissions control, papers were presented on selective catalytic oxidation of CO in H_2 for fuel cell applications, low-temperature catalytic oxidation of VOCs with ozone, high-temperature combustion of methane, hydrodechlorination of chlorofluorocarbons, selective reduction of NO by CH_4 and by propylene, recovery of elemental sulfur from SO_2-laden gas streams, and oxidative catalytic removal of hydrocarbons.
2. In the area of Environmentally Benign Technologies, papers were presented on the use of solid acids in chemical synthesis, isobutane/butene alkylation and light *n*-alkane isomerization on solid acid catalysts, use of basic zeolites, high temperature gas shift catalysts, indoor-air quality improvement by photocatalysis, photocatalytic reactors, catalysis in supercritical fluids, and clean technologies through two-phase catalysis.

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