



Chemical Industry Vision2020 Overview

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AICHE 2006 Spring Meeting

Chemical Industry **VISION2020**

Technology Partnership

An industry-led program to accelerate technology development and innovation by leveraging technical and financial resources needed for the chemical industry to continue as the global leader into the next century

Visit us at

www.ChemicalVision2020.org

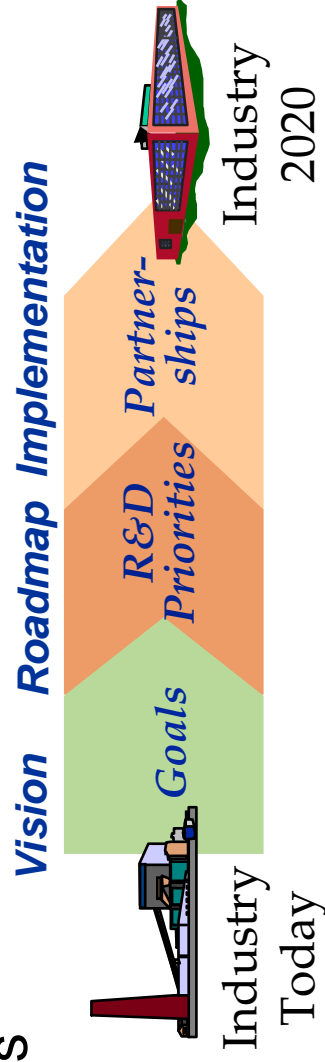
- Air Products & Chemicals Inc.
- BP
- Ciba Specialty Chemicals
- The Dow Chemical Company
- E.I. du Pont de Nemours and Company
- Eastman Chemical Company
- General Electric Company
- INEOS (formerly BP/Innovene)
- Praxair, Inc.
- Rohm and Haas Company
- Shell
- Solutia
- Westinghouse Savannah River Company
- American Chemical Society
- American Institute of Chemical Engineers
- Council for Chemical Research
- Materials Technology Institute

Vision 2020: >100 Participants in 2004



Vision2020 Implementation

- ◆ Identify technology areas for R&D collaborations in pre-competitive areas that will result in widespread implementation of continuous improvement and/or breakthrough technologies to help enhance the competitiveness of the chemical industry and meet societal needs
- ◆ Facilitate formation of teams to implement industry-wide R&D collaborations
 - ▶ Industry, including medium and small businesses
 - ▶ National Laboratories
 - ▶ Academia



Vision 2020 Roadmaps Completed

- ◆ Biocatalysis
- ◆ New Process Chemistry
- ◆ Combinatorial Chemistry
- ◆ Reaction Engineering
- ◆ Computational Chemistry
- ◆ Separations
- ◆ Computational Fluid Dynamics
- ◆ Measurements for Process Control
- ◆ Materials of Construction
- ◆ Nanomaterials By Design
- ◆ Materials Technology
- ◆ Ionic Liquids



Driving Gas Phase Equilibrium Processes with Adsorbents and Membranes

Industrial Team

Air Liquide – DuPont	Fusfeld
Air Products	GE
BOC	Honeywell
BP	Membrane T&R
CDTECH	Pall
CeraMem	Praxair
Ceramatec	Shell
Eastman Chemical	Sulzer Chemtech
Fairfield Resources	UOP

Candidate Industrial Processes

- ◆ **H₂ industrial production: chemical, petrochemical, & refining industries**
- ◆ CO₂ separation and sequestration
- ◆ Olefins production - light hydrocarbons
- ◆ Hybrid distillation of azeotropes
- ◆ Dehydration for esterification
- ◆ Isomerization: n-butane to isobutane, xylenes, etc.

Driving Gas Phase Equilibrium Processes with Adsorbents & Membranes: Goals

- ◆ Define current commercial practices
- ◆ Describe emerging literature, key concepts
- ◆ Emphasize breakthrough technologies
- ◆ Recommendations for future R&D
 - ▶ Near Term 0 – 5 yrs
 - ▶ Longer Term 7 – 15 yrs
 - ▶ Adsorbent and adsorption process development
 - ▶ Membrane and membrane process development

Driving Gas Phase Equilibrium Processes with Adsorbents and Membranes

- ◆ **H₂ production: chemical & petrochemical industries report published**
 - ▶ Water gas shift for H₂
 - ▶ Reforming
- ◆ **Authors**
 - ▶ James A Ritter
 - ▶ Armin D. Ebner
- ◆ **Sponsor**
 - ▶ Department of Energy
Industrial Technology Program

