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Department of Chemistry

Special Seminar

4 p.m. Friday, October 4, 2013 • 402 Walter Library



Research & Development Director
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Inorganic Materials & Heterogeneous Catalysis
Dow Chemical Company

Innovation in Industry

Abstract

By Cathy Tway and Eric Stangland

Typically the time from project initiation to the breakeven point after commercialization for new materials and chemical processes can be on the order of 10 to 20 years, with the timeline becoming lengthier as the technologies become more disruptive. Significant resources are being expended to develop means to accelerate innovation, with many of them targeted towards discovery activities. However, the time required to recoup R&D investment costs after commercialization is at least as lengthy as the time required for the discovery itself and understanding the limitations in the commercialization cycle is vital in terms of developing opportunities to accelerate new technology adoption. Better assessment of the complexities of the market and value chains offer a means to accelerate industrial R&D, and a few case studies that highlight these challenges will be described.

In addition to market considerations, technical issues outside of the initial problem space can be a key hurdle in the commercialization process. The introduction of shale gas and natural gas liquids in North America has created a dramatic shift for the chemical industry resulting in an improved competitive cost position due to low cost feedstock availability. However, the primary component of natural gas is methane and not natural gas liquids like ethane, and methods to directly activate methane to economically produce chemicals at the industrial scale have not been developed and remain an elusive goal. Dow has spent considerable effort investigating alternative methane activation routes, attempting to economically directly convert methane-to-olefins with world-scale selectivity and capital intensity requirements in mind. The second portion of this talk will demonstrate the industrial challenges faced when a total systems approach must be considered in the development process.

Host: Professor Laura Gagliardi