Wise Choices in Large Scale Separation and Purification Process Options

William J. Koros
Georgia Institute of Technology
Atlanta, GA 30327 USA

Large scale separation and purification processes transform low value resources into more useful fuels, basic chemicals, food and clean water; however, they also consume a great deal of energy. Growing global population, increased competition for natural resources and the desire for better worldwide standards of living will intensify demands upon such processes. These trends will place a heavy burden on available energy resources and lead to large increases in carbon dioxide emissions under a “business as usual” scenario. Approaches that minimize energy intensive thermally-driven separations can allow as much as an order of magnitude reduction in energy intensity per unit of product purified. While already used for water purification, more efficient approaches such as reverse osmosis cannot yet be used widely, due to lack of advanced materials suitable for use with non-aqueous feeds. Recent developments in membrane and sorbent materials now appear likely to extend the low energy intensity separation revolution beyond water to include the full spectrum of large scale feeds. This seminar will discuss these new materials as well as devices, their manufacturing and the savings they enable.