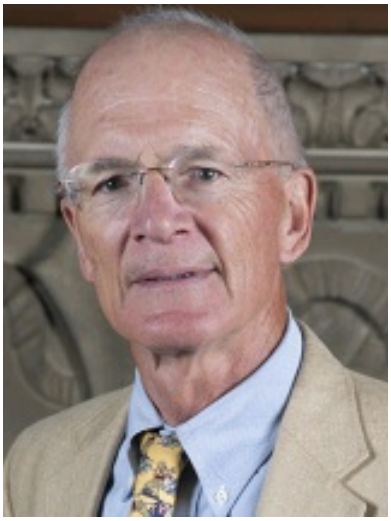
Chemical Engineering & Materials Science

UNIVERSITY OF MINNESOTA



Ed Cussler Jr

Professor Emeritus

Contact Information

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Education

B.E., Chemical Engineering, Yale University, 1961
M.S., Chemical Engineering, University of Wisconsin at Madison, 1963
Ph.D., Chemical Engineering, University of Wisconsin at Madison, 1965
D.Sc. (Honoris Causa), University of Lund, 2002
D.Sc. (Honoris Causa), Nancy Universite, 2007

Research Areas

Catalysis, Separations & Reaction Engineering
Transport & Fluid Mechanics

Research Interests

Research in this group is limited by Dr. Cussler's retirement. The remaining topics center on coupled diffusion and chemical reaction. At present, the key topics are crystallization enhanced by high pressure, ammonia production by coupled absorption and catalytic reaction, and the purification of organic light emitting diodes by sublimation. The studies of crystallization aid purification of non-volatile moderate molecular weight molecules, including some drugs and agrochemicals. The production of ammonia tries to build a small ammonia plant which is powered by wind. The sublimation studies, a key to the low cost production of flat screen televisions, involve three types of transport: conventional diffusion, Knudsen diffusion, and molecular velocity. All topics are anchored within chemical engineering.

Awards

Institute Lecture, AIChE, 2014
Merryfield Design Award, American Society of Engineering Education, 2005
National Academy of Engineering, 2002
American Chemical Society Separations Science Award, ACS, 2002
W. K. Lewis Award, AIChE, 2001
None

Selected Publications

Column Absorption for Reproducible Cyclic Separation in Small Scale Ammonia Synthesis, (with K. Wagner, M. Zhu, M. Malmali, C. Smith, N.C.A. Seaton, A.V. McCormick), AIChE Journal 63 3058-3068 (2017).

Volume Diffusion in Purification by Sublimation, (with N. Singh, T. E. Schwartzentruber, R.J. Holmes), AIChE Journal, 63,1757-1764 (2017).

Ammonia Synthesis at Reduced Pressure via Reactive Separation, (with M. Malmali, Y.M. Wei, A. McCormick) Ind. Eng. Chem. Res. 55, 8922-

8932 (2016).

Performance of a Small-Scale Haber Process, (with M. Reese, C. Marquart, M. Malmali, K. Wagner, E. Buchanan, A.V. McCormick) Ind. Eng. Chem. Res., 55, 3742–3750 (2016).

Sublimation as a Function of Diffusion, (with G. Qian, N.T. Morgan, R.C. Froese, R.J. Holmes) AIChE Journal 63, 861-867(2016).