Leland M. Vane, Chemical Engineer in EPA's National Risk Management Research Laboratory

Land and Materials Management Division
Mailing Address

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Areas of Expertise:

- Environmental applications of membrane-based pervaporation and vapor permeation technologies for sustainable biofuel production, industrial solvent reclamation, desalination, and wastewater treatment (green separations technologies).
- Polymer synthesis, polymer-particle interaction, membrane-based separation process design, and chemical process design.
- Removal of heavy metals from aqueous waste streams utilizing biologically-produced sequestering agents.
- Electrokinetic remediation of contaminated soils.

Select Publications:

L.M. **Vane**, "Review: Water recovery from brines and salt-saturated solutions: operability and thermodynamic efficiency considerations for desalination technologies," Journal of Chemical Technology and Biotechnology, 92(10):2506-2518, (2017).

L. **Vane**, V.V. Namboodiri, G. Lin, M. Abar, and F. Alvarez, "Preparation of water-selective polybutadiene membranes and their use in drying alcohols by pervaporation and vapor permeation technologies," ACS Sustainable Chemistry & Engineering, 4, 4442-4450 (2016).

L.M. **Vane**, "Separations vs. Sustainability – there is no such thing as a free lunch," Chapter in Sustainability in the Analysis, Synthesis and Design of Chemical Engineering Processes, ed. by G. Ruiz-Mercado and H. Cabezas, Elsevier, pp35-65 (2016).

G. Lin, M. Abar, and L.M. **Vane**, "Mixed matrix silicone and fluorosilicone/zeolite 4A membranes for ethanol dehydration by pervaporation," Separation Science and Technology, 48, 523-536 (2013).

L.M. **Vane**, "Separation technologies for the recovery and dehydration of alcohols from fermentation broths," Biofuels, Bioproducts and Biorefining, 2, 553-588 (2008).

L.M. **Vane** and F.R. Alvarez, "Membrane Assisted Vapor Stripping – Energy efficient hybrid distillation-vapor permeation process for alcohol-water separation," Journal of Chemical Technology and Biotechnology, 83(9):1275-1287, (2008).

View more research publications by Leland Vane

Education:

- Ph.D., Cornell University, Ithaca, NY; Chemical Engineering (Minor: Environmental Engineering), 1992
- B.Ch.E., University of Delaware, Newark, DE; Chemical Engineering, 1987

Professional Experience:

Workgroups and Projects

- Lead for NRMRL Separations Research Team
- Principal Investigator for Environmental Applications of Pervaporation and Vapor Permeation: Sustainable BioFuel Production Industrial Solvent Reclamation, Desalinization, and Wastewater Treatment
- Advisory Editorial Board: *Journal of Chemical Technology & Biotechnology* (2010-present)

Select Honors and Awards

- U.S. EPA Scientific and Technological Achievement Award (STAA) – Level III award, 2015
- U.S. EPA Office of Research & Development – Sustainability Award, Green Separation Team Pilot Unit Project, 2013
- U.S. EPA National Honor Award – Silver Medal for Superior Service, for outstanding scientific and leadership contributions establishing EPA as a pioneering organization in the area of Green Chemistry, 2012
- U.S. EPA STAA – Two Level III awards, 2010
- National Risk Management Research Lab. Environmental Solutions Award – Runner Up, 2008
- Federal Service Excellence Award, Project Team category, 2002
- U.S. EPA STAA Level I, for outstanding research and development activities to reduce material demands and costs for in-situ soil remediation, 2001
- U.S. EPA Science Achievement Award in Waste Management, for outstanding design, planning and demonstration of remediation fluid recycling using pervaporation technology to greatly reduce site cleanup costs and material requirements, 1999
- U.S. EPA Bronze Medal, for cooperative research & development with industrial partners, 1996

Selected Patents

- U.S. Patent 7,622,045 B2: “Hydrophilic cross-linked polymeric membranes and sorbents”, L. **Vane**, R. Ponangi, and V. Namboodiri (issued November 24, 2009).
- U.S. Patent 8,114,255: “Membrane augmented distillation with compression to separate solvents from water” (issued February 14, 2012), L.M. **Vane**, F.R. Alvarez, Y. Huang, and R.W. Baker.
- U.S. Patent 9,266,803 B2: “Liquid separation by membrane assisted vapor stripping process” (issued February 23, 2016), L.M. **Vane** and F.R. Alvarez.

Science Matters: EPA Scientists Pioneer Methods for Greening Biofuels Production