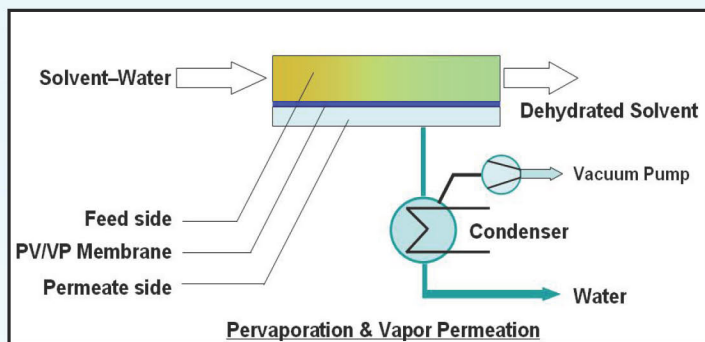


NaA Zeolite Pervaporation Membrane Process for Solvent Dehydration

Pervaporation & Vapor Permeation is an energy efficient combination of membrane permeation and evaporation. It's considered an attractive alternative to other separation methods like Extractive Distillation, Molecular Sieve for a variety of processes. Pervaporation is used for the dehydration of organic solvents and the removal of organics from aqueous streams.



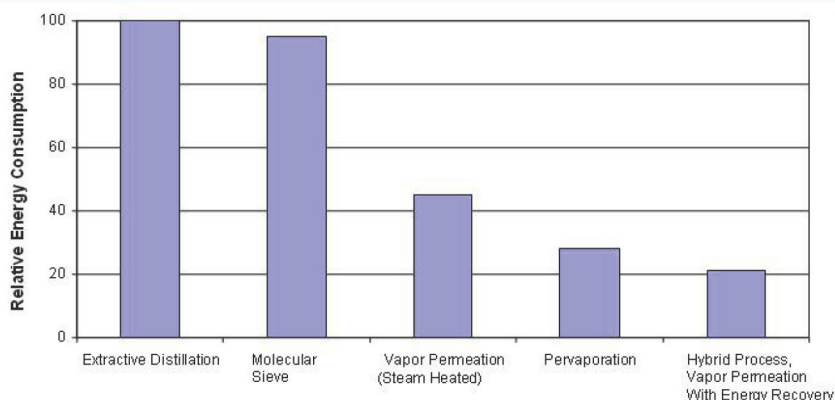
Pervaporation involves the separation of two or more components across a membrane by differing rates of diffusion through a thin layer and an evaporative phase change comparable to a simple flash step. A concentrate and vapor pressure gradient is used to allow one component to preferentially permeate across the



membrane. A vacuum applied to the permeate side is coupled with the immediate condensation of the permeated vapors. Pervaporation is typically suited to separating a minor component of a liquid mixture, thus high selectivity through the membrane is essential. Pervaporation can be used for breaking azeotropes, dehydration of solvents and other volatile organics, organic/organic separations such as ethanol or methanol removal, and wastewater purification.

Process Advantages

- * Low energy consumption, low running cost
- * No entrainer required, no contamination
- * Less waste effluent
- * Easy maintenance
- * Functions independent of vapor/liquid equilibrium



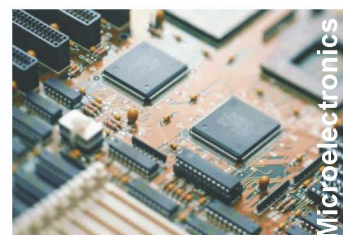
Fuel ethanol



Pharma & Food



Petro Chemical



Microelectronics

PV/VP technology can be used for the following products

Methanol	Acetone	Ethyl tert-butyl ether (ETBE)
Ethanol	Butanone	Di-isopropyl ether (DIPE)
Propanol & IPA	Methyl isobutyl ketone (MIBK)	Tetrahydro furan (THF)
Butanol & IBA	Triethylamine	Dioxane
Pentanol	Pyridine	Methyl acetate
Cyclohexanol	Aniline	Ethyl acetate
Benzyl alcohol	Chlorinated hydrocarbons	Butyl acetate
Benzene	Dichloro methane	Acetic acid
Toluene	Perchloroethylene	
Phenol	Methyl tert-butyl ether (MTBE)	



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