

Feasibility Study of the Binary Fluid Mixtures C₃H₆/C₄H₁₀ and C₃H₆/C₅H₁₂ Used in Diffusion-Absorption Refrigeration Cycles

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Abstract : We propose in this work the thermodynamic feasibility study of the operation of a refrigerating machine with absorption-diffusion with mixtures of hydrocarbons. It is for a refrigerating machine of low power (300 W) functioning on a level of temperature of the generator lower than 150 °C (fossil energy or solar energy) and operative with non-harmful fluids for the environment. According to this study, we determined to start from the digraphs of Oldham of the different binary of hydrocarbons, the minimal and maximum temperature of operation of the generator, as well as possible enrichment. The cooling medium in the condenser and absorber is done by the ambient air with a temperature at 35 °C. Helium is used as inert gas. The total pressure in the cycle is about 17.5 bars. We used suitable software to modulate for the two binary following the system propylene /butane and propylene/pentane. Our model is validated by comparison with the literature's resultants.

Keywords : absorption, DAR cycle, diffusion, propylène

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