

Hydrodechlorination of CHClF_2 in Supercritical Fluids

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CHClF_2 (R-22) is one of the hydrochlorofluorocarbons (HCFCs), which has beneficial physicochemical properties such as stability, non-toxicity, and non-flammability. R-22 is widely used in refrigerant applications as a refrigerator and air conditioner. However, R-22 include chlorine, lead to depletion of the ozone layer and to enhance the global warming effect. For that reason, Globals agreed this problem and try to phase-out HCFCs.

In this study, hydrodechlorination of R-22 has been performed over Pd, Pt, Ru and Ni on high-surface-area support used as catalysts. The catalysts were characterized by IPC, XRD, BET and TEM. Catalyst prior to reduction. Reaction temperature and pressure were fixed to 300, 400°C and 100bar. The reaction time took 8hr. Starting the supercritical phase reaction, CHF_3 (R-23), CH_2F_2 (R-32), CH_4 (R-50) were the primary product. Under the Ni catalyst reaction, R-32 yield are in the range of 37-31% and selectivity is in the range of 60-78%.