

Dehydrofluorination of 1,1,2,3,3,3-hexafluoropropane to produce a refrigerant HFO-1234yf using a chromium oxyfluoride Lewis acid catalyst

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Environmentally-friendly refrigerant HFO-1234yf (2,3,3,3-tetrafluoropropene) has been developed particularly for the air conditioning in automobiles. One of the major reaction pathways to produce HFO-1234yf is dehydrofluorination of HFC-236ea (1,1,2,3,3,3-hexafluoropropane) to HFO-1225ye (1,2,3,3,3-pentafluoropropene) and HFC-245eb (1,2,3,3,3-pentafluoropropane) to HFO-1234yf. In this study, we attempted to obtain fluorinated metal oxides or metal oxyfluorides by liquid state fluorination. The catalysts were prepared by modified sol-gel methods and characterized with XRD, XPS, and N₂-Physisorbtion. The properties of prepared catalysts such as Lewis acid active sites and fluorine content in the surface were investigated to understand the highly active dehydrofluorination reaction.