# Solution polymerization of poly(HDFDA) in supercritical region of carbon dioxide and dimethyl ether mixture

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Dimethyl ether(DME) have attracted public attention for the industrial application possibility. After proving that DME is the eco-friendly substance, more people start studying the more various application of using DME. Therefore, our laboratory found that perfluoro monomer and polymer are soluble in the compressed liquid DME. Based on the discovery, the solution polymerization of heptadecafluorodecyl acrylate(HDFDA) in the compressed liquid DME, the supercritical $CO_2$($scCO_2$), and the mixtures of DME and $scCO_2$ was performed. Also, the solution polymerization in the compressed liquid DME with changing the concentration of the initiator 2,2'-azobisisobutyronitrile(AIBN) was carried out.

For getting the relative molecular weight order of the poly(HDFDA), the phase behavior of the binary mixture system of $CO_2$ and poly(HDFDA) was measured with a variable volume cell at the temperature range from 313K and 363K.