**338a High Pressure Viscosity and Density of Pmma + Acetone + CO2**

*Erdogan Kiran and Kun Liu*

High pressure viscosity and density of poly(methyl methacrylate) in mixtures of acetone plus carbon dioxide have been determined in the temperature range from 50 to 125 C over a pressure range from 7 to 35 MPa. Measurements were conducted with PMMA samples of different molecular weights (Mw 15,000, PDI = 1.8; and Mw = 540,000, PDI= 2.8)in the cocnetration range from 5 to 20 wt % using a specially designed falling-cylinder type viscometer. The viscometer is a variable volume system that also allows the determination of the density of the solutions.

The viscosities for the low molecular weight PMMA solutions in acetone were in the range from 0.2 to 1.1 mPa.s; and for the high molecular weight polymer in the range of 0.2 to 1.6 mPa.s depending upon the P/T conditions and the polymer concentration.

Effect of carbon dioxide addition was explored with the high molecular weight polymer solutions. At the same overall solution density, in the presence of 1 wt % CO2 , the solution viscosity was reduced by about 50 %. For the solutions containing CO2, to display the same level of viscosity, the solution needed to be compressed to higher densities.

Representation of viscosity as a function of solution density provides a quick visualization of the consequences of changes in the free volume on the system viscosity.