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**Concentration and Temperature Dependence of Viscosity in Mode-Coupling Theory of Binary Mixture of Water and Phenol**

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**Abstract**

The dynamic shear viscosity of a binary liquid mixture of water and phenol has been measured at different temperatures () and different concentrations (0.00% up to 100.00% by weight of phenol) by using glass capillary viscometer and Brookfield viscometer model DV-I+. The critical temperature and critical concentration have been determined to be 67.0 and 33.90% by weight of phenol respectively. The mode coupling theory (MCT) has been used to calculate the value of background viscosity (noncritical part of shear viscosity) cP, the Debye momentum cutoff and the MCT constant A = 0.050. The intermolecular force range L of water and phenol molecules in a binary mixture has been calculated to be 11.17. The large value indicates that the mutual force between binary mixture molecules can be considered as a week attractive force. The critical amplitude of specific heat under constant pressure at critical concentration and above critical temperature has been found to be by using the two scale factor university.