

## Cloud-Point Temperatures for the Aqueous Lysozyme-Ionic Liquid Solution Systems

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Liquid-liquid phase-separation data are obtained for the aqueous lysozyme-ionic liquid solution systems. Thermo-optical analysis (TOA) provides a simple, rapid, and reliable experimental method to determine cloud-point curves of aqueous protein solution systems. The cloud-point temperatures (CPTs) are measured as a function of the alkyl group chain length of cation, anion type, and ionic liquid concentration at pH 7.0 and the lysozyme concentration of 87g/L. Ionic liquids used are imidazolium derivatives: 1-ethyl-3-methylimidazolium chloride, 1-butyl-3-methylimidazolium chloride, 1-hexyl-3-methylimidazolium chloride, 1-ethyl-3-methylimidazolium hexafluorophosphate, and 1-ethyl-3-methylimidazolium trifluoromethanesulfonate. To speculate the effect of the alkyl group chain length of cation, we used ethyl group, butyl group, and hexyl group for the alkyl group of cation with the chloride anion. To research on the effect of anion type,  $\text{Cl}^-$ ,  $\text{PF}_4^-$ , and  $\text{CF}_3\text{SO}_3^-$  are used for anion with the 1-ethyl-3-methylimidazolium cation. Cloud-point temperatures are effected by the alkyl group chain length of cation and the anion size of ionic liquids.