Physicochemical properties of aqueous two phase systems using PEG

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The use of aqueous two phase systems (ATPs) has been chosen as a very interesting operation to perform separation or fractionation processes that uses mild experimental conditions that preserves the solutes nature and the properties. This kind of liquid-liquid extraction system is formed by a ternary mixture (generally mixing polymers and salts) that produces two immiscible phases: a polymer enriched top phase and a salt-enriched bottom phase[1,2]. The physicochemical properties of both phases could play an important role in the processes that involve mass transfer. This fact has an important influence upon the design of equipment and the control of the operation taking into account solutes concentration and temperature.

The most common polymer used in ATPS is poly(ethylene glycol) and it is usually chosen as a separating medium because the systems thus formed constitute a facile environment for biomolecules, where the polymers employed do not have any denaturing properties.

Present work analyzes the value of different physicochemical properties (density, speed of sound, electrical conductivity, viscosity and pH) were determined for different liquid phases in equilibrium. Figure 1 shows an example of the experimental data obtained for kinematic viscosity. These data shows an important influence of polymer upon the value of this property. For the main part of the properties analyzed (density, speed of sound, electrical conductivity) the salt-enriched phases show the higher values. The pH is similar for all the liquid phases analyzed in equilibrium.

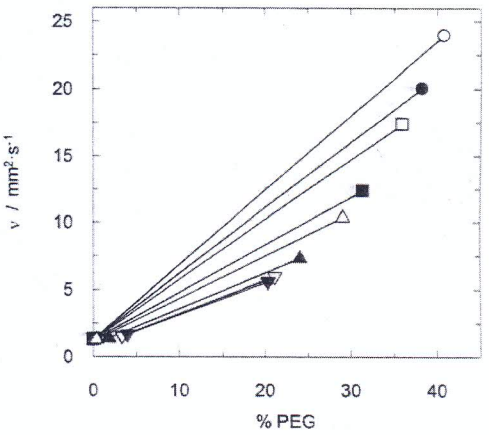

Figure 1. Kinematic viscosity for PEG2000+Ammonium sulfate

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References

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