Cloud-point extraction of bismuth (III) with nonionic surfactants in aqueous solutions

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Abstract :

Two-aqueous phase extraction of bismuth (III) as a solute from its aqueous solutions was investigated using polyethoxylated alcohols (CiEj) as a biodegradable non-ionic surfactant. Cloud points of these surfactants were found to be functions of their concentrations and concentrations of additives. The concentration effect of non-ionic surfactants on the cloud point was determined when the phase diagrams of water-surfactant binary systems (C13E10 and C12E10) were being traced. According to the given surfactant concentration, the extracted solute at pH = 3 arrived at 86% and 45% for C12E10 and C13E10, respectively, in one step. Addition of inorganic salts can either increase or decrease the cloud points. For example, the addition of sodium chloride lowers the cloud points of surfactants. According to the optimal extraction conditions, the extraction mechanism is based on bismuth species – CiEj non-anionic surfactant micelle solvation.

Keywords : Cloud point; Bismuth (III); C12E10 non-ionic surfactant; C13E10 non-ionic surfactant; Extraction.

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