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SOLVENT SUBLATION OF COPPER IONS**O.C. Bolielyi, T.I. Obushenko, N.M. Tolstopalova**

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Heavy metals belong to the most common and dangerous pollutants. Thus, the development of new improved and economical methods for metallic ions removing appears to be actual problem for researchers and technologists.

Flotation methods are rather perspective in these terms, particularly solvent sublation is a combination of ion flotation and liquid extraction, combining advantages of both methods. Solvent sublation is such a flotation process in which flotation product (sublate) concentrates in a thin layer of organic liquid, which is immiscible with water, and locates on the surface of aqueous phase. Thanks to economy, high production and simplicity, solvent sublation may be used not only in practice of waste water treatment but also in chemical technologies and analytical chemistry as preparation method. There are some advantages of solvent sublation: 1) the ability to work efficiently with big volumes of water containing toxic compounds at low concentrations due to the independence of removal index from the ratio of organic solvent to aqueous phase; 2) it is not an equilibrium process and isn't limited by solvent partition coefficient; 3) high selectivity of the process.

Therefore, extraction of minor amounts of elements in theory can reach 100%. In many cases the fact that extracted substance is concentrated in organic phase considerably makes its further recycling easier [1]. During this process possibility of copper ions extraction by the method of solvent sublation with the use potassium caprylate as a collector (surfactant) and isopentanol as an organic solvent was researched. The process has been carried out in a glass column, in a form of cylinder, the bottom of which was the Schott filter. Through the porous partition gas was supplied from gas cylinder, consumption of which was controlled by rotameter. The process of extraction was carried out to constant residual concentration of metal ions, which were determined by photometric method [2]. Initial concentration of metal ions in model solution equals 100 mg/dm^3 ; solution volume equals 200 cm^3 ; organic solvent volume equals 5 cm^3 ; gas velocity equals $40 \text{ cm}^3/\text{min}$. As effectiveness measure degree of metal extraction (X) was chosen. For more effective removal of copper ions the collector (surfactant), potassium caprylate and organic solvent – isoamyl alcohol were chosen experimentally.

Influence of pH on recovery rate of metal ions was investigated. Molar ratio of Cu: surfactant varies between 0,2–3. The maximum degree of extraction was 98% at pH of 6 and a molar ratio of Cu: surfactant = 1:1,5. Process duration is 15–20 min.

Further researches can be aimed at studying the composition of formed sublate to solve the problem of recuperation of removing copper, surfactant and extragent, possibilities of increasing process efficiency, influence of different impurities on recovery rate of copper ions.

References:

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