

Removal of Perchlorate using Surfactant based Precipitation Method

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Perchlorate ion (ClO_4^-) has been detected in a large amount in surface and ground water primarily in the USA. Wastes from the manufacture and improper disposal of perchlorate-containing chemicals are increasingly being discovered; creating an unforeseen water contamination problem. A cationic surfactant, CPC was used as precipitant to remove perchlorate. Centrifugal method was used to obtain the precipitation. Concentration of CPC and perchlorate in supernatant was analyzed using UV spectrophotometer and Ion chromatography, respectively. The effect of nitrate, sulfate and carbonate on precipitation rate of perchlorate was also studied. It was observed that the optimum removal of perchlorate by precipitation begins with the 1:1 or higher ratio of CPC and perchlorate. This can be explained by the binding site available for each CPC to bind each perchlorate ion obtained by replacing chloride ion with perchlorate ion. The experimental result showed good agreement with the fact that the precipitation using surfactant can be an economical alternative removal method for perchlorate from groundwater.