ABSTRACT

This study involves a process of solvent extraction of Holmium (III) using Sudan black B (SBB) as extracting reagent.

Effect of the various parameters on the extraction process were investigated aiming to reach best values for the distribution ratio and percent of extraction (E%).

Benzene was the best solvent for the extraction of the Holmium (III) ion, (D) and (E%) values of the extracted complex was not effect by dielectric constant values of the solvent.

The result indicated that the best periods for equilibrium were (25) min. at best pH = 9.

The result also showed that (D) value increase with the increase of $Ho_{(III)}$ concentration.

Investigating the role of temperature on the extraction indicated that (D) values increase with the increase of the temperature and by calculating the functions (ΔH_{ex}, ΔG_{ex}, ΔS_{ex}) revealed that the extraction of [Ho $(SBB)_3$ $(No_3)_3$] complex was endothermic process. The results also indicated that salting out effect lead to decrease the (D) values.

To evaluate the effect of presence of some cations and anions as common interfering on the extraction of Ho (III), the results indicated that existence of the cations (Gd^{+3} – pr^{+3} – La^{+3} – Ce^{+3} – Ni^{+2} – K^{+1}, Mg^{+2}) leads to decrease in (D) and (E%) values, while existence of the anions (Cl^{-1} – Br^{-1} – $Cr_2O_7^{-2}$ – SO_4^{-2} – NO_3^{-2}) leads to irregular decrease in (D) and (E%) values.

The study also shows that batch extraction technique enhanced the extraction efficiency, but Enrichment extraction technique lead to decrease in (D) and (E%) values.

Also from the (uv-vis) spectra of [Ho $(SBB)_3$ $(N0_3)_3$] complex (λ max) was located, and from (IR) spectra we can proving the complex formation.

Using the slope analysis method, ratio method and substiochiometry method , designated the stochiometry of the extracted complex; all indicated that the ratio of reagent to ion is (3:1) (L:M), and the Quantitative analysis method prove the suggested formula.

Other physical constant namely, melting – point, instability constant and molar conductivity was measured. At last the new study for determination of Ho(III) Ion in organic phase was began.