This study includes the process of extracting liquid-liquid for La(III) and

Nd (III) ions, separately, by reagent N-Acetyl-cysteine (NAC) .A study had

been done to show the influence of various factors which influence the value of

distribution ratio (D) and percentage extraction (E%).

The best pH for the extraction of Nd(III) was (9) and (5) for La(III) by

ligand (NAC), separately. The best period for equilibrium was (60) minute for

La(III) and (50) for Nd(III), The results showed the best solvent of extraction

process of La(III) were chloroform and toluene for Nd(III) .

To evaluate the effect of the presence of cations and anions as common

interfering on the extracting of La(III) and Nd(III) ions, individually , the results

indicated that lead to different in (D) and (E%) values with existence of the

variable concentration of cations and anions .

The effect of oxidizing and reducing agents was also studied , from the result

for this study the (D) and (E%) decrease by using oxidizing agent and increase

by using reducing agent .

The enrichment extraction technique leads to adecrease in (D) and (E%)

values.The results also showed that (D) and (%E) values augmented with the

increase of the concentration of La(III) and Nd(III) with (NAC) as well as the

increase of the concentration of ligand (NAC) showed increase of (D), (E%).

To study the influence of temperature degrees , found the value of (D) for

the extraction of La(III) and Nd(III) with reagent (NAC), separately, increase

by increasing temperature degrees . The function of thermodynamic ( Δsex,

ΔGexand ΔHex) were calculated, and the results showed that the reaction of

[La(III)-(NAC)] and [Nd(III)- (NAC)] were endothermic.

The ‘salting out’ effect using ammonium chloride salt was studied, the study

showed that (D) and (E%) values for the ions were effected by this

parameter.The batch extraction technique enhanced the extraction not

effected.

The study of the stiochiometry of the extracted is by using two methods

mole ratio and Jobs method (continues change ) . The results showed

aconnection of La(III) and Nd(III) , individually, with reagent NAC was (1:3).

The( UV-vissible) spectra and (FT-IR) spectra were studied both for reagent

(NAC) and extracted complexes [La(NAC)3]and [Nd(NAC)3].Other physical

constant namely, (melting point and electrical conductivity) in the room

temperature .