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SEPARATION OF RARE EARTH ELEMENTS OF THE LIGHT SUBGROUP USING DIFFERENT EXTRACTANTS

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Strategic elements, such as rare earth elements, play a crucial role in industry, especially in the production of high-tech materials. The world's largest industries are heavily dependent on rare earth materials. Every year there are innovations in industries such as modern technology, green energy or communication technology that require more strategic metals.

The following types of extraction can be used to extract metals from the aqueous to the organic phase: cation-exchange, anion-exchange and extraction with neutral reagents. The most frequently used neutral extractant is tributyl phosphate ($\text{C}_4\text{H}_9\text{O})_3\text{P}=\text{O}$ (TBP).

The neutral extractant consumes less acid and base due to being a neutral target metal complex. The selectivity of TBP is lower than that of acidic extractant. Also for this extractant, the acidity of the aqueous phase has a significant effect on the solubility of the extractants, inhibiting their dissociation. At limited concentration, REEs are extracted by TBP worse than nitric acid.



Due to the fact that the extraction process is influenced by a large number of factors, experiments should be conducted for each new extraction step to establish the extent of this influence.