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CERIUM OXIDE RECOVERY FROM CONCENTRATE OF MONAZITE ORES

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Background: The main sources for rare earth element are in the REs Ores such as monazite, xenotime and bastnaesite. One of the most famous of classical ores that found in mineral sources is monazite. The concentrate of cerium and the other rare earth element in low concentration produced through acid leaching digestion. The high value in commercial rate of cerium salt depends on their quality and purity of concentrate. This work describes the study the leaching process steps from monazite minerals. The parameters considered were: rate of pulp in acid leaching, pH control, filtration, precipitate agent, time of acid leaching and the effect of impurities of Monazite.

Methods: The Cerium and Res concentrate and in this experiment was resulted by mechanical and physical methods for purification and the final steps alkaline digestion and purification of filtrate concluded. The chemical composition of the concentrate as feed and intermediate products used in this study were analyzed by ICP-MS methods. The other rare earth elements was remained in the final filtrate. The experiment were carried out in glassy vessel on batch systems. The pH control throughout the process was completed by ammonia solution.

Results: The amount of the acids and the reagent added are depended to stoichiometric values. The efficiency of the precipitation of impurities from concentrate concerns to temperature control. The recovery of cerium through this procedures was formed by organic ligands as complexing agent. The influence of K_{sp} complexes were investigated. According to the XRD patterns, cerium oxide phase increased in final precipitation.

Conclusion: Purification of cerium salt from the concentrate studied by the main variables process to oxalate precipitation and its conversion into hydroxide then oxide in the final steps. The assaying yield of cerium oxide. With the high purity greater than 88%. This project leads to substantial economy, as chemical reagent and energy concerned, thus making the cerium oxide recovery in wet chemical process.

Key words: Cerium oxide; RE Concentrate; Monazite ore; Purification

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