

**WATER AND SULFURIC ACID LEACHING OF A
SRI LANKAN ZIRCON CONCENTRATE
PROCESS BY ALKALI FUSION**

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by

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Abstract

Upgrade zircon has recently moved in to the focus of high tech applications and shows considerable difference between compare with 60-65 % pure zircon. Because of that industry has higher demand for upgrading zircon and research and development are being conducted.

Zircon has higher chemical durability, low toxicity and strong structural affinity for uranium and thorium (Trocelier, p. 2003). Because of that zircon treatment is difficult comparing other compounds. Various methods, steps are being used to upgrade zirconium percentage of zircon sand and thermal dissociation, decomposition by fusion, mechanical zirconia processing and hydrothermal decomposition are few (Ashraf, M.A. 2006). Comparing all these methods alkali fusion with sodium hydroxide is most suitable because of requirement of low capital, low operation cost and it is not required expensive equipment and reagents.

There is no studies on upgrade Sri Lankan zircon sand and this research focus on verify the exact upgrade percentage of Sri Lankan zircon via alkali fusion method and investigate sulfuric acid concentration of acid leaching and volume of water leaching.

For the experiment, zircon samples were collected from Lanka mineral sand limited and prepared a frit with 10g of zircon mixed with 15g of sodium hydroxide and heated in ceramic crucible of 575⁰C during 30 minutes. Forty frit samples were prepared and undergo with water leaching under four different volume of water. Filtered solid residue was undergo with 2, 3, 4, 5 and 6mol⁻¹ sulfuric acid leaching. Final filtered solution were treated with ammonium hydroxide and resulted solid was dried and roasted.

Final solid samples were analyzed under XRF analysis and verified 50 ml volume as the water leaching volume, 3 mol⁻¹ as the exact sulfuric concentration for sulfuric acid leaching. Finally verified that Sri Lankan zircon could be enhanced up to 93.04% via alkali fusion with sodium hydroxide.

Key words: Alkali fusion, XRF analysis, water leaching, acid leaching