

## SYNTHESIS AND STRUCTURAL PROPERTIES OF $\text{Al}_2\text{O}_3$ - $\text{ZrO}_2$ NANO COMPOSITE PREPARED VIA SOLUTION COMBUSTION SYNTHESIS

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### ABSTRACT

In this research, an alumina–zirconia composite containing 20 wt % zirconia was prepared by solution combustion synthesis (SCS) method using aluminum nitrate and zirconium nitrate as precursors whereas urea as fuel. The observed X-ray diffraction pattern within temperature range of 600 to 1200<sup>0</sup>C revealed that with the increase in temperature t-ZrO<sub>2</sub> phase shifted to m-ZrO<sub>2</sub>. Moreover the morphological characteristic using FTIR, in corroboration with XRD, confirms the crystallization of corundum ( $\alpha$ -  $\text{Al}_2\text{O}_3$ ) as one of the alumina phase and monoclinic phase of zirconia at 1200<sup>0</sup>C. Micro structural characterization by SEM depicted that the particles tend to be more agglomerated with increasing temperature. Comparatively high average pore size of 4nm and surface area of 92m<sup>2</sup>/g were calculated using BET analyzer.

**KEYWORDS:**  $\text{Al}_2\text{O}_3$ - $\text{ZrO}_2$ , SCS, BET, FT-IR, Surface Area