

## Synthesis and Characterization of Binary $\text{Al}_2\text{O}_3$ - $\text{ZrO}_2$ Mixed Oxides with Different Al/Zr Molar Ratio

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A series of  $\text{Al}_2\text{O}_3$ - $\text{ZrO}_2$  composite oxides with different Al/Zr molar ratio were synthesized using co-precipitation method with aluminum nitrate and zirconyl nitrate hydrate as starting materials. Mixed  $\text{Al}_2\text{O}_3$ - $\text{ZrO}_2$  ( $x\text{Al}-y\text{Zr}$ ) was characterized by XRD, TG-DTA, FT-IR, SEM-EDX, XPS. The major phases of the composites were tetragonal  $\text{ZrO}_2$  and  $\gamma$ - $\text{Al}_2\text{O}_3$  although monoclinic  $\text{ZrO}_2$  phase also was detected as a minor phase even after calcination at 900°C. As compared with pure  $\text{ZrO}_2$ , the BET surface area, total pore volume, the surface OH radical and thermal stability increased with increasing the Al/Zr mole ratio. The increase of  $\text{Al}_2\text{O}_3$  in  $\text{Al}_2\text{O}_3$ - $\text{ZrO}_2$  mixed oxide led to retard the particle growth of zirconia and the phase transformation from tetragonal to monoclinic phase. For the catalytic evaluation of Pt/ $\text{Al}_2\text{O}_3$ , Pt/ $\text{ZrO}_2$  and Pt/ $\text{Al}_2\text{O}_3$ - $\text{ZrO}_2$  prepared by impregnation method CO oxidation was performed.