

Tailoring the particulate properties of aluminates prepared by combustion method

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Aluminium based spinels constitute an interesting class of oxide ceramics with technological applications such as abrasives, pigments, catalysts, phosphors etc. The nano-structured ceramics display improved properties over the bulk materials¹. Nano-crystalline aluminate spinels MA_2O_4 , $M = Zn$ and Mn , have been prepared by the combustion of aqueous solutions containing the corresponding metal acetate, aluminium nitrate and various fuels like urea, carbonylhydrazide, oxalyl hydrazide, hexamethylene tetramine and glycine. Interestingly spinels prepared by using metal acetate precursors yield nanosize (10–100 nm) oxides having very large surface area (40–180 m²/g) compared to the nitrate precursor². The products have been characterised by powder XRD. The particulate properties have been investigated using TEM. The particle size is found to vary from 10 to 100 nm depending upon the fuel.

References

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2. Kingsley J J, Suresh K and Patil K C 1990 *J. Mater. Sci.* **25** 1305