

## 63. EFFECT OF MgO AND $Y(NO_3)_3 \cdot 6H_2O$ ON TRANSPARENCY OF ALUMINA

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Transparent alumina is a polycrystalline ceramic with cubic crystal structure and is optically transparent in near-ultraviolet, visible and near-infrared regions of the electromagnetic spectrum. Because of its relatively low weight, optical and mechanical properties, and its resistance to damage due to oxidation or radiation, it finds its major application in defense and structural field. In this work, slurry of  $Al_2O_3$  is added with various proportions of MgO and  $Y(NO_3)_3 \cdot 6H_2O$  and mixed well with solvent. This mixture is then dried in hot air oven and well grinded. The powder mixture along with binder is formed into pellets using hydraulic press at constant pressure. The pellets are then sintered in Tubular box furnace at various sintering temperatures into Transparent Alumina. The influence of the nature of doping element at various temperatures were studied which influences the grain size in turn the transparency of the sintered Alumina. The transparency mainly depends on the grain size, porosity, density, temperature and pressure. It is studied that increase in temperature at constant pressure increases the transparency of Alumina as its optical properties are highly dependent on grain size, grain growth and porosity in order to increase the real inline transmittance.

Key words: Grain size, Porosity, Transparency, Transparent Alumina, Sintering.