

**SYNTHESIS AND THERMAL STUDIES OF TITANIUM DIOXIDE
PREPARED BY SOL-GEL METHOD**

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ABSTRACT

SYNTHESIS AND THERMAL STUDIES OF TITANIUM DIOXIDE (TiO₂)

PREPARED BY SOL GEL METHOD

A titanium dioxide (TiO₂) powders was synthesized by the sol-gel method under room temperature using titanium nitride (TiN) as the precursor. The titanium dioxide powder then was characterize using simultaneous thermal gravimetric analyzer (TGA) to measure the weight loss of a material as a function of temperature. From TGA results, the stable weight loss of titanium dioxide powders was observed in the temperature range of 750°C. Then, 3 samples were prepared which annealed at temperature 800°C for 5 hour, 800°C for 10 hour, and 800°C for 24 hour. The titanium dioxide synthesized powders was characterized by X-ray diffraction (XRD). XRD patterns revealed that, the samples comprise a single phase rutile structure of titanium dioxide. The crystal structure of titanium dioxide is tetragonal where it space group is s P42/mnm. No anatase peak can be observed after sintering at 800°C. So, only rutile peak are dominate. From the result of the phase and structure of titanium dioxide, a single phase rutile can be synthesized by sintering at a temperature of 800°C for only 5 hour.

