

## EFFECT OF AGING ON PHYSICAL AND CHEMICAL PROPERTIES OF SYNTHESIZED TiN NANOPOWDER

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Changing physical and chemical properties of previous synthesized TiN nanopowder after 8 years aging has been concerned. Initial nanocrystalline TiN powder had been synthesized through reaction of titanium oxide (anatase) with ammonia gas in temperature range of 700-1000°C. Particle size of initial powders was in range of 33-39 nm that has been changed to 36.5-46 nm after aging. XRD results showed presence of oxide layers containing Ti<sub>2</sub>O<sub>3</sub>, Ti<sub>6</sub>O<sub>11</sub> and TiO<sub>2</sub>. SEM and TEM observations confirmed formation of these oxide layers. Density changing measured with helium pycnometer was less than 5%. Obtained results reveal surface area decrease about 16% after aging.

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Figures:

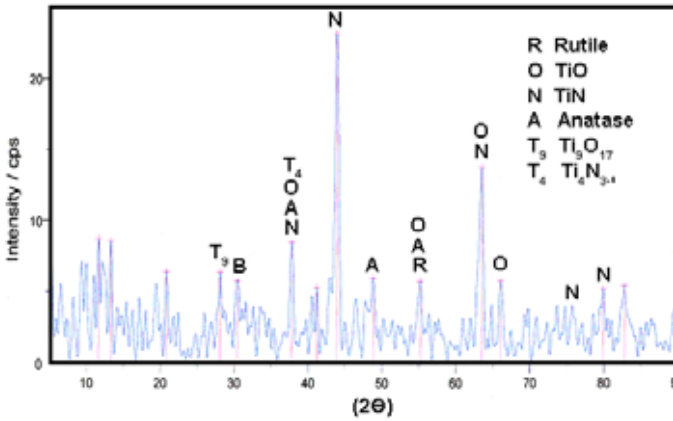


Fig1. X-ray patterns of synthesized sample at 800°C after aging

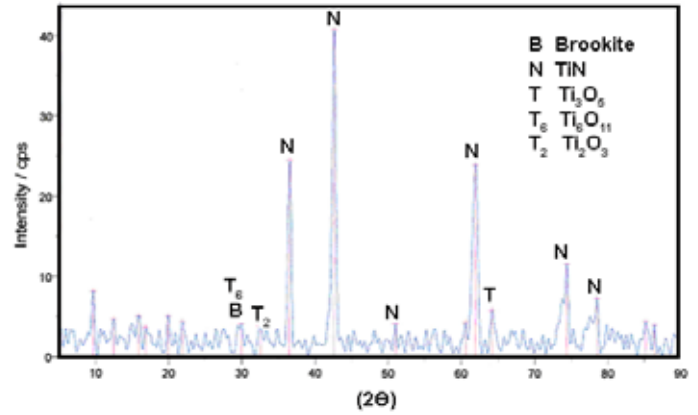


Fig2. X-ray patterns of synthesized sample at 1000°C after aging

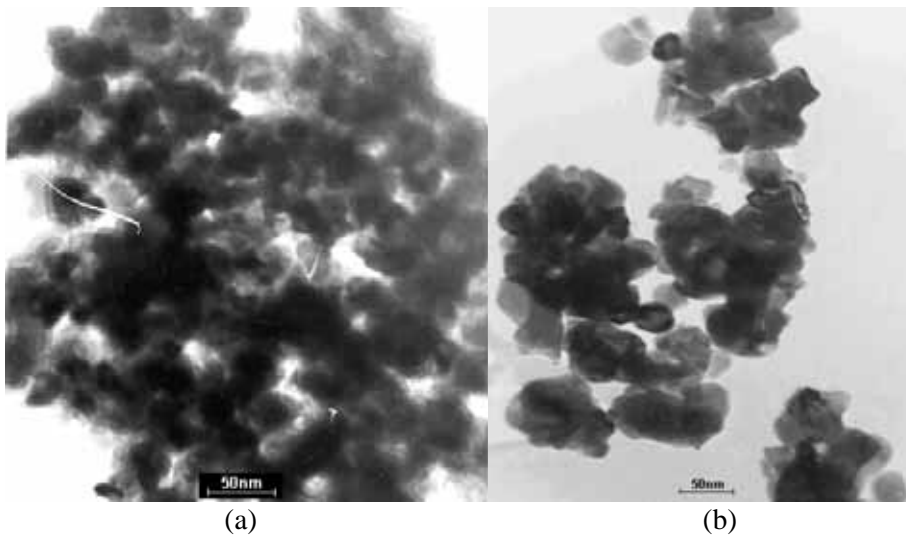


Fig3. TEM micrographs of sample synthesized (a) at 800°C (b) at 1000°C after aging

