

## EFEK DOPANT TERHADAP STRUKTUR DAN KARAKTER DARI FOTOKATALIS POWDER TITANIA

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### ABSTRACT

The structure and characterization of the titania (M-TiO<sub>2</sub>) can be modified by metal doped and calcinations temperatures variation by sol-gel method. Characterization of gel and M-TiO<sub>2</sub> powder realized by FT-IR, TGA, XRD, Photo Optic and SEM. Titania has two crystal structures such as anatase and rutile. Anatase structures shown higher photocatalytic properties than rutile. The crystal structure was characterized to JCPDS reference no. 21-1272,  $2\theta$  : 25.3° identically as anatase structure and  $2\theta$  : 27.3° as rutile. Structure modification is depend on calcinations temperature change. At 400°C the anatase structure was formed. The anatase intensity was increased at 500°C and at 600°C anatase transportation to rutile was found and anatase mixture was obtained. Several types of dopant can inhibit anatase to rutil transformation process at temperature  $\geq$  600°C. Park *et al.*,<sup>[1]</sup> reported that calcinations temperature and valence ion dopant influence the crystal size. Based on Scherrer's equation the crystal size can be calculated by using the XRD data. The crystal size of maximum intensity which was identified as anatase structure at 500°C as following Fe-TiO<sub>2</sub> 10.6 nm, MoTiO<sub>2</sub> 16.8 nm. M-TiO<sub>2</sub> character through inhibition of *E. Coli* bacteria growth was great infulenced by particle size and dopant ion type. This character shown by MIC value (Minimal Inhibition Concentration)) of each Fe, Mo-TiO<sub>2</sub> between 0.35 – 0.45%.

**Keywords** : *crystal structure, characterization, titania, sol-gel*

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