

## ABSTRAK

### PENGARUH TiO<sub>2</sub> TERHADAP KARAKTERISTIK GLASIR PADA UBIN

Dalam upaya peningkatan kualitas ubin keramik saniter untuk memenuhi kebutuhan sanitasi lingkungan, dilakukan pembuatan ubin keramik antibakteri. Bahan antibakteri yang digunakan berupa TiO<sub>2</sub> anatase karena dapat bersifat fotokatalis. Digunakan variasi konsentrasi 0 – 5% TiO<sub>2</sub> pada ubin glasir. Ubin glasir antibakteri diuji penampakan permukaannya secara visual dan digunakan alat *Brightness* untuk mengetahui nilai W\* nya. Semakin banyak TiO<sub>2</sub> yang ditambahkan, maka hasil nilai W\* semakin rendah yang menunjukkan bahwa *Whiteness* (efek warna putih) semakin berkurang. Dilakukan analisis SEM untuk mengetahui struktur morfologi permukaan ubin glasir dan dilakukan XRD untuk mengetahui jenis kristal pada bahan ubin glasir dan serbuk glasir. Hasil SEM menunjukkan lapisan glasir dan terdapat TiO<sub>2</sub> berbentuk seperti bongkahan di atasnya. Dari hasil XRD didapatkan puncak-puncak mineral kuarsa, mullite, anatase, rutile, dan kristobalit. Untuk aplikasi dilakukan dua analisis berupa persen dekolorisasi dan uji antibakteri. Hasil uji dekolorisasi larutan metilen biru 10 ppm didapatkan persen optimum pada serbuk glasir 2%. Dan adanya sifat fotokatalis tersebut menyebabkan TiO<sub>2</sub> juga bersifat sebagai antibakteri karena dihasilkan ROS (OH\*, O<sub>2</sub><sup>-\*</sup>, dan H<sub>2</sub>O<sub>2</sub>). Hasil antibakteri didapatkan bahwa semakin tinggi konsentrasi TiO<sub>2</sub> pada serbuk glasir dan ubin glasir semakin besar pula Diameter Daya Hambat (DDH) bakteri tersebut.

Kata-kata kunci: Ubin, Glasir, XRD, SEM, Persen Dekolorisasi, ROS, dan DDH

## **ABSTRACT**

### ***EFFECT OF TiO<sub>2</sub> ON GLAZE CHARACTERISTICS ON TILES***

*In an effort to improve the quality of sanitary ceramic tiles to meet the needs of environmental sanitation, an antibacterial ceramic tile was made. The antibacterial material used is TiO<sub>2</sub> anatase because it can be photocatalyst. Variations in the concentration 0 – 5% TiO<sub>2</sub> were used on glaze tiles. Antibacterial glaze tiles were visually tested for their surface appearance and the Brightness tool was used to determine their W\* values. The more TiO<sub>2</sub> is added, the lower the W\* value, which indicates that the Whiteness (white color effect) decreases. SEM analysis was performed to determine the surface morphology structure of glaze tiles and XRD was carried out to determine the type of crystals in glaze tile material and glaze powder. The SEM results show a glaze layer and there are TiO<sub>2</sub> shaped like chunks on top of it. From the XRD results obtained peaks of mineral quartz, mullite, anatase, rutile, and cristobalite. For the application, two analyzes were carried out in the form of percent decolorization and antibacterial testing. The decolorization test results of 10 ppm blue methylene solution obtained the optimum percent in 2% glaze powder. And the photocatalyst properties cause TiO<sub>2</sub> also to be antibacterial because it is produced by ROS (OH<sup>\*</sup>, O<sub>2</sub><sup>-\*</sup>, and H<sub>2</sub>O<sub>2</sub>). Antibacterial results showed that the higher the concentration of TiO<sub>2</sub> in glaze powder and glaze tiles the greater the Inhibitory Diameter (DDH) of the bacteria.*

*Key words: Tiles, Glaze, SEM, XRD, Percent Decolorization, ROS, and DDH*



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