

## Formulation of water-based white colour paint from waste titanium dioxide

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### ABSTRACT

This work explains the production and synthesis of white paint pigment colour from waste titanium dioxide (TiO<sub>2</sub>). Pigments are widely employed in paper, plastic, and paint production. A white pigment called TiO<sub>2</sub> is responsible for about seventy percent of pigments used today. Even though minerals that contain TiO<sub>2</sub> within the earth's crust are relatively abundant, the production of virgin TiO<sub>2</sub> for industrial application consumes enormous energy and can lead to an environmental problem. Hence, a need arises for the paint industry to seek an alternative to replacing virgin TiO<sub>2</sub> pigment that is commonly utilised in formulating paints. This study was conducted to examine the probability of using secondary TiO<sub>2</sub> pigments as an alternative to virgin pigments to formulate white paint from industrial waste. In this study, the prospect of using waste TiO<sub>2</sub> to formulate white paint pigment in different ratios is compared with the paint industry. The paint industry and TiO<sub>2</sub> pigments were characterised by utilising thermo quantitative analysis TGA, XRD, and FTIR analysis. The obtained result showed 20% TiO<sub>2</sub> formulated paint provide the best result for the adhesion test that testify the optimum pH and viscosity for the paint with the classification of 3B which is comparable to paint industry performance.

### KEYWORDS

Pigment; Titanium dioxide; Virgin pigments; Waste paint; White colour

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