

Titanium dioxide summary report

Potential application:

Photo-catalyst

Preparation method:

Titanium dioxide:

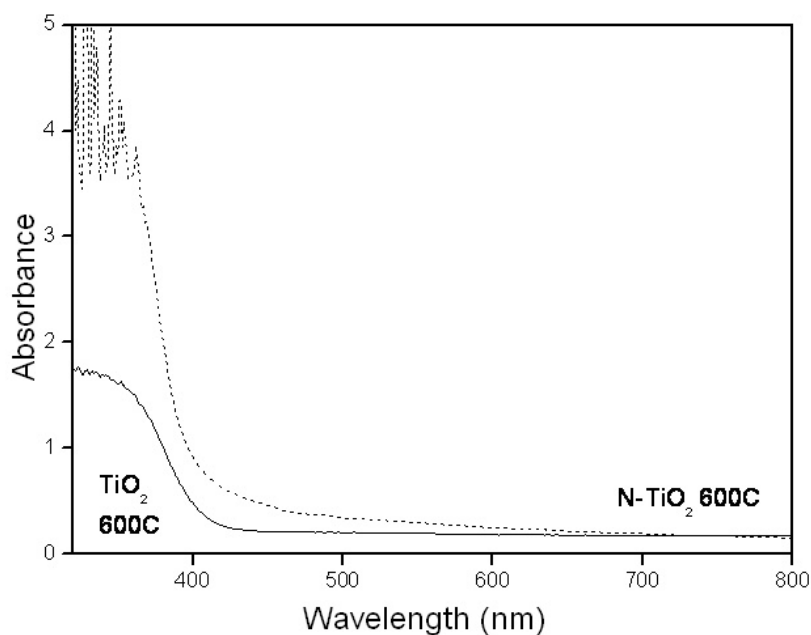
1. Add 25 cm³ of 90 mM titanium isopropoxide to 48 cm³ of 0.8 M glacial acetic acid stirring on a magnetic stirrer plate.
2. Add 150 cm³ of deionised water drop-wise to the partially hydrolysed titanium isopropoxide-acetic acid mixture. The solution will turn white. Ensure to maintain vigorous stirring.
3. Stir the solution until a clear transparent solution or sol is formed; this may take up to 8 hours.
4. Dry overnight at 100 °C in an oven vented into a fumehood.
5. Calcine the final product in air for 2 hours at 600 °C (anatase phase) and 700 °C (rutile phase) (ramp rate 5 °C min⁻¹).
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Nitrogen doped titanium dioxide:

1. Add 23.4 cm³ of 90 mM titanium isopropoxide to 206 cm³ of isopropanol stirring on a magnetic stirrer plate.
2. Add 5 g of urea dissolved in 35 mL of distilled water. Ensure to maintain vigorous stirring.
3. Stir the solution for 5 minutes.
4. Dry overnight at 80 °C.
5. Calcine the final product in air for 2 hours at 400 °C (ramp rate 5 °C min⁻¹).

Results:

The improved ability of N-doped TiO₂ to absorb visible light is shown in the absorbance spectrum, leading to increased photocatalytic activity over anatase TiO₂.



Absorbance spectrum of anatase TiO₂ and N-TiO₂