# Synthesis of titania nanotubes and titania nanowires by combination sonication-hydrothermal treatment and their photocatalytic activity for hydrogen production

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Abstrak

Titania nanotubes (TiO2 NT) and Titania nanowires (TiO2 NW) were fabricated using TiO2 Degussa P25 (TiO2 P25) nanoparticle as precursors via a sonication-hydrothermal combination approach. The prepared catalysts were characterized by means of an X-ray diffraction (XRD), scanning electron microscope (SEM), transmission electron microscope (TEM), ultraviolet-visible diffuse reflectance spectroscopy (DRS) and the Brunauer-Emmett-Teller technique (BET). The photocatalytic activity of prepared catalysts was evaluated for photocatalytic H2 evolution from an aqueous methanol solution. The results showed that activity of the catalyst not only depends on the morphology of its catalysts, but also on the crystalinity and surface area. Hydrogen production of TiO2 NT was about three times higher than TiO2 P25 and TiO2 NW was two times higher than TiO2P25.