

[Synthesis of mesoporous-assembled TiO\(2\) nanocrystals by a modified urea-aided sol-gel process and their outstanding photocatalytic H\(2\) production activity](#)

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Abstract: Mesoporous-assembled TiO(2) nanocrystals with very high photocatalytic H(2) production activity were synthesized through a modified sol-gel process with the aid of urea as mesopore-directing agent, heat-treated under various calcination temperatures, and assessed for their photocatalytic H(2) production activity via water splitting reaction. The resulting mesoporous-assembled TiO(2) nanocrystals were systematically characterized by N(2) adsorption desorption analysis, surface area and pore size distribution analyses, X-ray diffraction (XRD), scanning electron microscopy (SEM), and transmission electron microscopy (TEM). The experimental results showed that the photocatalytic H(2) production activity of the synthesized mesoporous-assembled TiO(2) nanocrystal calcined at 500 degrees C, which possessed very narrow pore size distribution, was extraordinarily higher than that of the commercially available P-25 TiO(2) and ST-01 TiO(2) powders. Copyright (C) 2011, Hydrogen Energy Publications, LLC. Published by Elsevier Ltd. All rights reserved.

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