Solvothermal Synthesis of SrTiO3-LnTiO(2)N Solid Solution and Their Visible Light Responsive Photocatalytic Properties

Publons ID	(not set)
Wos ID	WOS:000315412000017
Doi	10.1088/1757-8981/1/1/012017
Title	Solvothermal Synthesis of SrTiO3-LnTiO(2)N Solid Solution and Their Visible Light Responsive Photocatalytic Properties
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Publish Date	2008
Journal Name	IUMRS-ICA 2008 SYMPOSIUM AA. RARE-EARTH RELATED MATERIAL PROCESSING AND FUNCTIONS
Citation	4
Abstract	SrTiO3-LnTiO(2)N solid solution, Sr1-xLaxTiO3-yNy, was synthesized by the solvothermal reactions in KOH aqueous solution using [(CH3)(2)CHO](4)Ti, SrCl2 center dot 6H(2)O, La(NO3)(3)center dot 6H(2)O and HMT (hexamethylenetetramine) as raw materials. The samples were characterized by X-ray diffraction (XRD), transmission electron microscopy (TEM), thermogravimetric and differential thermal analysis (TG-DTA) and diffuse reflectance spectra. The nano particles of perovskite type Sr1-xLaxTiO3-yNy (x=0, 0.025, 0.05 and 0.1 named as ST, STN-0.025, STN-0.05 and STN-0.1) were successfully synthesized by solvothermal method. The photocatalytic activity of SrTiO3 for DeNO(x) ability in visible light region (>510nm) could be improved by co-doping of La3+ and N3-. The high visible light photocatalytic activity of this substance may be due to generating of a new band gap that enables to absorb visible light. The photocatalytic activity of Sr1-xLaxTiO3-yNy changed with variation of La content. The powder with smaller ratio of La content possessed excellent photocatalytic activity under visible light irradiation.
Publish Type	Book in series
Publish Year	2008
Page Begin	(not set)
Page End	(not set)
Issn	1757-8981
Eissn	
Url	https://www.webofscience.com/wos/woscc/full-record/WOS:000315412000017
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