Correlations for coumarin additive on the electrical and photocatalytic activity of TiO2 modified by thiourea

By: Soylu, M (Soylu, M.)[1] ; Al-Ghamdi, AA (Al-Ghamdi, Ahmed A.)[2] ; Farooq, WA (Farooq, W. A.)[3] ; Yakuphanoglu, F (Yakuphanoglu, F.)[2,4]

View ResearcherID and ORCID

MICROELECTRONIC ENGINEERING
Volume: 154 **Pages:** 26-37
DOI: 10.1016/j.mee.2016.01.026
Published: MAR 25 2016
View Journal Impact

Abstract

Doping of TiO2 was made with thiourea to introduce the C, N and S into the TiO2. In order to investigate the effect of coumarin additions, coumarin-doped TiO2 samples modified by thiourea were synthesized by the same method. X-ray diffraction pattern confirmed the anatase crystalline phase in the doped-TiO2 samples. XRD data shows that the addition of coumarin and thiourea does not lead to the rutilization during sample crystallization. In order to investigate the photocatalytic performance of coumarin doped-TiO2 samples, the current-voltage and photocapacitance transient measurements of Au/cou-doped TiO2/p-Si heterojunction structures were carried out under illumination. The variation in the transient decay after illumination follows the different compositions introduced by the addition of coumarin and thiourea. This suggests that there is a correlation between the decay kinetics and the mechanism such as traps and recombination centers provided by the doping level. (c) 2016 Elsevier B.V. All rights reserved.

Keywords

Author Keywords: TiO2; Sol-gel process; Electrical properties

KeyWords Plus: SCHOTTKY-BARRIER DIODES; INTERFACIAL OXIDE LAYER; POLYMER SOLAR-CELLS; VISIBLE-LIGHT; TITANIUM-DIOXIDE; TRANSPORT-PROPERTIES; OPTICAL-PROPERTIES; SERIES RESISTANCE; SIZE DEPENDENCE; PHASE-STABILITY

Author Information

Reprint Address: Soylu, M (reprint author)

+ Bingol Univ, Fac Sci & Arts, Dept Phys, Bingol, Turkey.

Addresses:

+ [1] Bingol Univ, Fac Sci & Arts, Dept Phys, Bingol, Turkey
+ [2] King Abdulaziz Univ, Fac Sci, Dept Phys, Jeddah, Saudi Arabia
+ [3] King Saud Univ, Coll Sci, Dept Phys & Astron, Riyadh 11451, Saudi Arabia
+ [4] Firat Univ, Dept Phys, Fac Sci, TR-23169 Elazig, Turkey

E-mail Addresses: soylum74@yahoo.com

Funding

Funding Agency	Grant Number
Deanship of Scientific Research at King Saud University	RG-1435-059

View funding text

Publisher

ELSEVIER SCIENCE BV, PO BOX 211, 1000 AE AMSTERDAM, NETHERLANDS

Categories / Classification

Research Areas: Engineering; Science & Technology - Other Topics; Optics; Physics

Web of Science Categories: Engineering, Electrical & Electronic; Nanoscience & Nanotechnology; Optics; Physics, Applied

Document Information

Document Type: Article

Language: English

Accession Number: WOS:000378363400006

ISSN: 0167-9317

eISSN: 1873-5568

Journal Information

Table of Contents: Current Contents Connect

Impact Factor: Journal Citation Reports

Other Information

IDS Number: DP2ZY

Cited References in Web of Science Core Collection: 70

Times Cited in Web of Science Core Collection: 1