

Accession number:20114214431015

Title:Effect of solvent on carrier transport in poly(3,4-ethylenedioxythiophene)/poly(4-styrenesulfonate) studied by terahertz and infrared-ultraviolet spectroscopy

Authors:Yamashita, Masatsugu (1); Otani, Chiko (1); Shimizu, Masahiro (2); Okuzaki, Hidenori (3)

Author affiliation:(1) RIKEN, 519-1399 Aoba, Aramaki, Aoba, Sendai, Miyagi 980-845, Japan; (2) Tokyo Electron, Akasaka Biz Tower, 5-3-1 Akasaka, Minato, Tokyo 107-6325, Japan; (3) University of Yamanashi, 4-4-37 Takeda, Kofu, Yamanashi 400-8511, Japan

Corresponding author:Yamashita, M.(m-yama@riken.jp)

Source title:Applied Physics Letters

Abbreviated source title:Appl Phys Lett

Volume:99

Issue:14

Issue date:October 3, 2011

Publication year:2011

Article number:143307

Language:English

ISSN:00036951

CODEN:APPLAB

Document type:Journal article (JA)

Publisher:American Institute of Physics, 2 Huntington Quadrangle, Suite N101, Melville, NY 11747-4502, United States

Abstract:The effect of solvent such as ethylene glycol (EG) on the carrier transport in poly(3,4-ethylenedioxythiophene)/poly(4-styrenesulfonate) (PEDOT/PSS) was studied by the combination of terahertz (THz) time-domain transmission spectroscopy (0.1-3 THz) and broadband reflectance spectroscopy (4-800 THz). While the broadband reflectance showed a plasma edge in the near-infrared, the frequency dependence of the THz conductivity of PEDOT/PSS indicated weakly localized carrier behavior. The simultaneous fitting of both spectra by the localization-modified Drude model allowed us to conclude that the significant increase in conductivity with the addition of EG is due to improved carrier mobility in the PEDOT/PSS.

Number of references:17