Dokumenttyp: Zeitschriftenaufsatz


Titel des Beitrags: Organophosphonates as model system for studying electronic transport through monolayers on SiO2/Si surfaces

Abstract: We report electrical transport measurements made on alkylphosphonate self-assembled monolayers grown on nanometer-thin SiO2 on top of highly p-doped silicon. At small bias direct tunneling is characterized by a decay constant of $\beta = 0.7$/carbon. At larger positive bias to the silicon (1.1–1.5 V) the current-voltage traces feature a prominent shoulder, reminiscent of a negative differential resistance. We attribute this feature to a significant reduction in trap-assisted tunneling, as supported by a simulation. Hence, organophosphonate monolayers are excellent model systems to study electrical transport through ordered structures; they also provide highly efficient electrical passivation of the SiO2/Si surface.

Stichworte: Self assembly Tunneling Monolayers Negative resistance Semiconductor growth

Zeitschriftentitel: Appl. Phys. Lett. 102, 241602 (2013)

Jahr: 2013

Jahr / Monat: 2013-06

Quartal: 2. Quartal

Monat: