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Fabrication of Biomimetic Superhydrophobic and Transparent ZnO Nanorod Arrays

이정환, 곽근재, 용기중

포항공과대학교

ZnO nanorod (NR) arrays prepared via simple ammonia hydrothermal method exhibiting superhydrophilicity, high transmittance and antireflection. These properties result from the unique surface structure and material property of ZnO NR arrays. Highly rough surface due to ZnO NRs enhanced hydrophobicity/hydrophilicity of the films and short NRs (about 300 nm) made ZnO arrays transparent. ZnO NR films were chemically modified by dipping the sample into 5mM stearic acid/ethanol solution for 3 hours. Then the ZnO NRs became superhydrophobic surfaces, whose contact angle reached 159.2° maintaining their high transmittance. These biomimetic ZnO NR arrays can be used in diverse field, such as antifogging/self-cleaning surfaces and optical devices.

Keywords: Superhydrophobic