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Antifouling Transparent ZnO Thin Films Fabricated by Atmospheric Pressure Cold Plasma Deposition YOSHIFUMI SUZAKI, Professor, Faculty of Engineering, Kagawa University, JINLONG DU, Graduate School of Engineering, Kagawa University, TOSHIFUMI YUJI, Faculty of Education & Culture, University of Miyazaki, HAYATO MIYAGAWA, KAZUFUMI OGAWA, Faculty of Engineering, Kagawa University — One problem with outdoor-mounted solar panels is that power generation efficiency is reduced by face plate dirt; a problem with electronic touch panels is the deterioration of screen visibility caused by finger grease stains. To solve these problems, we should fabricate antifouling surfaces which have superhydrophobic and oil-repellent properties without spoiling the transparency of the transparent substrate. In this study, an antifouling surface with both superhydrophobicity and oil-repellency was fabricated on a glass substrate by forming a fractal microstructure. The fractal microstructure was constituted of transparent silica particles 100 nm in diameter and transparent zinc-oxide columns grown on silica particles through atmospheric pressure cold plasma deposition; the sample surface was coated with a chemically adsorbed monomolecular layer. Samples were obtained which had a superhydrophobic property (with a water droplet contact angle of more than 150°) and a high average transmittance of about 90% (with wavelengths ranging from 400 nm to 780 nm).

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