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Multifunctional superhydrophobic surfaces with carbon nanotubes by direct patterning of conducting pastes**Junghoon Kim, Joon Young Cho, Hee Jin Jeong, Seung Yol Jeong, Seon Hee Seo, Geon Woong Lee and Joong Tark Han**
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Carbon nanomaterials have been used in various applications like electro-wetting, static charge dissipation and electrical circuits. Carbon nanomaterials such as Carbon Nanotubes (CNTs), graphene, graphite and carbon fibers have been utilized to fabricate electrically conducting and superhydrophobic surfaces because of their ability to remove the static charges accumulated on surfaces. The directly printed superhydrophobic surfaces containing conducting nanomaterials can be used for a wide range of applications in terms of non-wetting, anisotropic wetting, and electrical conductivity. Here, we demonstrated that direct-printable and flexible superhydrophobic surfaces were fabricated on flexible substrates via with an ultra-facile and scalable screen printing with Carbon Nanotube (CNT)-based conducting pastes. A polydimethylsiloxane (PDMS)-Polyethylene Glycol (PEG) copolymer was used as an additive for conducting pastes to realize the printability of the conducting paste as well as the hydrophobicity of the printed surface. The screen-printed conducting surfaces showed a high water contact angle (WCA) ($>150^\circ$) and low contact angle hysteresis (WCA $<5^\circ$) at 25 wt% PDMS-PEG copolymer in the paste, and they have an electrical conductivity of over 1000 S m⁻¹. Patterned superhydrophobic surfaces also showed sticky superhydrophobic characteristics and were used to transport water droplets. Moreover, fabricated films on metal meshes were used for an oil/water separation filter.

Biography

Junghoon Kim has completed his Master's degree from Kumoh National Institute of Technology, Republic of Korea . Currently, he is a Researcher of Korea Electrotechnology Research Institute.

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