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ORIGINAL ARTICLE

Green fabrication of superhydrophobic poly(furfuryl alcohol)-coated melamine sponge

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Supplementary Material

Characterization

Thermal stability was analyzed by thermogravimetric analysis (TGA) using a Setaram Labsys Evo S60/58988 thermal analyzer (France) under nitrogen flow. Samples were heated from 50 to 800 °C at a rate of 10 °C/min. Fourier-transform infrared (FTIR) spectra were recorded on a Bruker Tensor 27 spectrometer (Germany) in the range of 4000–500 cm^{-1}. Surface morphology was investigated using scanning electron microscopy (SEM) equipped with energy-dispersive X-ray spectroscopy (EDX) on a Hitachi JEOL JSM-6700F system (Japan). The chemical states of membranes were investigated using X-ray photoelectron spectroscopy (XPS) (Thermo VG Multilab 2000) with monochromic Al Kα (1486.6 eV) as the X-ray source. The water contact angle (WCA) of the membranes was measured on an Optical Contact Angle Device (DataPhysics, Germany).

Table S1. WCAs of different modified sponge materials and their surface modification strategies reported in the literature.

Modified materials	Material type	Contact angle (°)	Reference
PDA/HDTMS/$NH_2(CH_2)_{11}COOH$	Polydopamine, silane, long-chain alkyl	~150	[1]
Fluoroalkylsilane/Fe_3O_4	Fluorinated silane, magnetic nanoparticles	~152	[2]
Catechol/DETA/n-dodecanethiol	Polyphenol-amin, long-chain alkyl	>150	[3]
CNT/PDMS	Carbon nanotubes, polydimethylsiloxane	~162	[4]
Dopamine/Fe_3O_4/ n-dodecanethiol	Dopamine, magnetic nanoparticles, long-chain alkyl	~154	[5]
Methyltrichlorosilane	Silane coating	>150	[6]
$C_{11}H_{23}COOAg$	Long-chain alkyl, silver	~170	[7]
PDA-Fe_3O_4-Ag	Polydopamine, magnetic nanoparticles, silver	156.3	[8]
rGO/AC/PDMS	Graphene oxide, activated carbon, polydimethylsiloxane	164	[9]
Kaolinit/GO	Clay, graphene oxide	152.3	[10]
MgAl-LDH	Layered double hydroxide	163.2	[11]
Fe_3O_4	Magnetic nanoparticles	152	[12]
P15C-O/Fe_3O_4	Long-chain alkyl, magnetic nanoparticles	149	[13]
PDA-Ag	Polydopamine, silver	155.9	[14]
PFA/DES	Poly(furfuryl alcohol), deep eutectic solvent	167.6	This work

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