Supporting Information

Recycling of PE gloves waste as highly valuable products for efficient separation of oil-based contaminants from water

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Types of oil/water separation materials	Raw materials	Methods	Intrusion pressure	Separation efficiency	References
PE coated mesh	Recycled PE gloves, nontoxic	Simple immersion for several seconds, time-saving	6.5 kPa	99.9%	Our work
PDA-NDM mesh	Dopamine, n-dodecyl mercaptan, low-toxic	First immersion in solution of dopamine for 40 h, then reacted with NDM for 6h	2.18kPa	98.12%	42
Octadecylphosphonic acid (ODPA) coated mesh	Octadecylphosphonic acid, low-toxic	Simple immersion method	NA	99%	43
PTFE-containing coated mesh	Polytetrafluoroethylene, polyvinyl acetate, sodium dodecyl benzene sulfonate, fluorinated	Complicated spray and calcination method	NA	95%	8
Layered double hydroxides (LDH) functionalized textile	Magnesium nitrate hexahydrate, aluminum nitrate nonahydrate, low-toxic	Synthetizing LDH precursors and then hydrothermally treated for 24h, finally the textile was immersed in solution of sodium laurate for 1 h	NA	97%	44
Silicone nanofilaments coated polyester textile	Trichloromethylsilane, high-toxic	Complicated CVD method	NA	High (qualitative description)	45

Bioinspired multifunctional polyurethane foam	Chromic acid, fluoroalkylsilane, high-toxic and fluorinated	The foam was etched with chromic acid and then was modified with solution of fluoroalkylsilane for 24h	NA	95.5%-98%	46
BNNT-coated mesh	Boron powder, NH_3	Boron powder was first ball-milled for 50 h and then annealed at 1100 °C for 8 h under H_2/N_2 gas	NA	High (qualitative description)	47
FAS or SYLGARD coated mesh	1H,1H,2H,2H-Per-fuorooctyltriethoxysilane, SYLGARD 184 Silicone Elastomer, toxic and fluorinated	The mesh was first immersed into $CuCl_2$ solution and then was immersed in a FAS ethanol solvent, finally was dissolved in chloroform	NA	96%	48
Polyaniline (PANI) coated cotton fabric	Aniline, PTES (C14H19F13O3Si), toxic and fluorinated	Complicated vapor phase deposition method	NA	97.8%	49
PLA oil absorption and filtration materials	PLA	Non-solvent induced phase separation and template synthesis method	1.0 kPa	97%	50
PDVB modified mesh	Divinylbenzene, 2,2'-azoisobutyronitrile, ethyl acetate	Solvothermal route	6.027 kPa	99.99%	16
ZnO coated mesh	ZnO nanoparticles, Stearic acid	A spray-coating process through tuning the surface composition	2.45 kPa	98.5%	51

Graphdiyne-based superhydrophobic foam	Pretreated-copper foam, TMEDA, pyridine, and acetone	In situ Glaser–Hay coupling by using copper foam as both robust 3D porous substrate and catalyst	0.87 kPa	98%	52

Table S1 Comparison of the properties between the PE coated mesh and the reported oil/water separation materials.

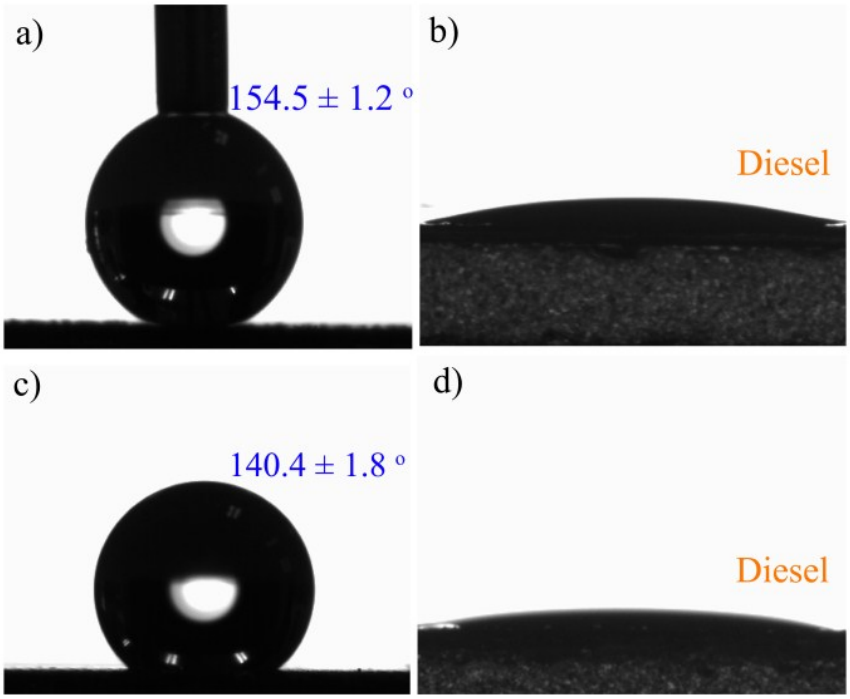

Fig. S1 The as-prepared mesh showed special wettability: a) the photograph of a water droplet (2 μL) on the commercial PE coated mesh with a contact angle of 154.5 ± 1.2°; b) A diesel oil droplet (2 μL) spread and permeated quickly on the commercial PE coated mesh; c) the photograph of a water droplet (2 μL) on the recycled gloves PE coated mesh with a contact angle of 140.4 ± 1.8°; d) A diesel oil droplet (2 μL) spread and permeated quickly on the recycled gloves PE coated mesh.

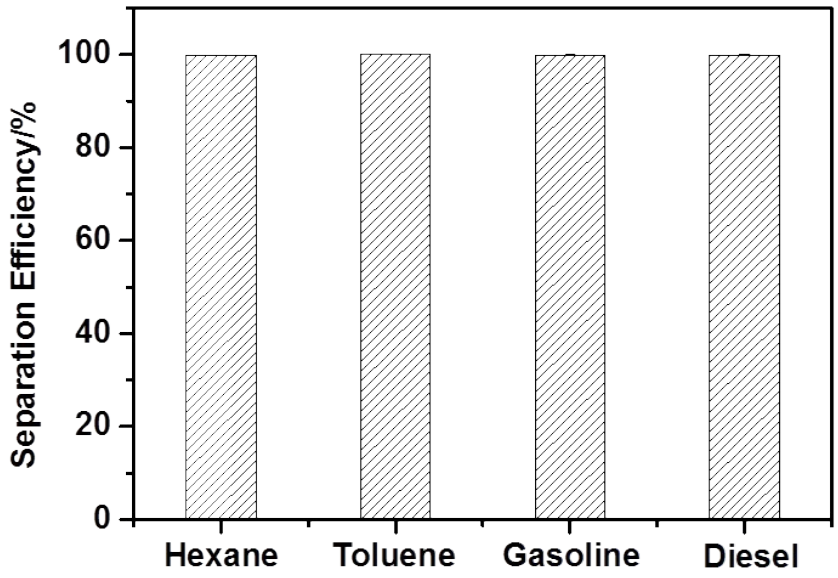

Fig. S2 The separation efficiencies of the water phase in the upper glass after separation using the recycled gloves PE coated mesh for four kinds of oil/water mixtures.

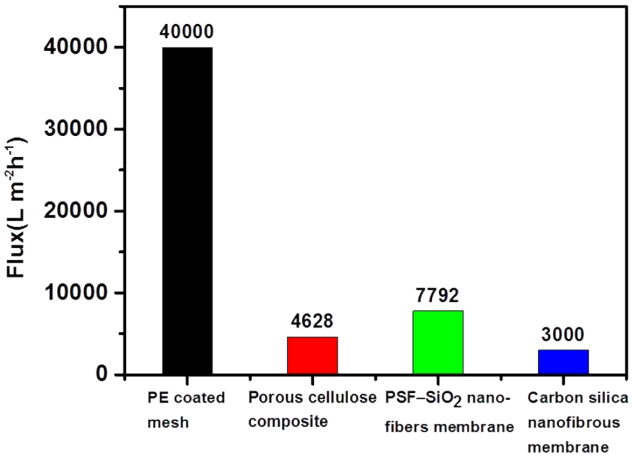

Fig. S3 The fluxes of the recycled gloves PE coated mesh, porous and hydrophobic cellulose composite, PSF–SiO_2 nanofibers membrane and carbon−silica nanofibrous membrane.

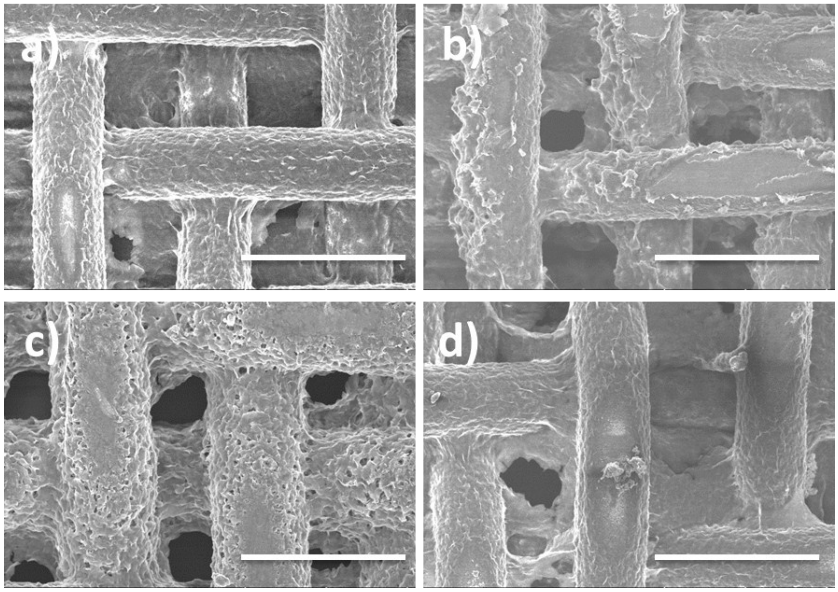

Fig. S4 SEM images of the mesh after separating four kinds of oil/water mixtures 30 times using the recycled gloves PE coated mesh. a) SEM image of the mesh after separating hexane/water mixtures 30 times. b) SEM image of the mesh after separating toluene/water mixtures 30 times. c) SEM image of the mesh after separating gasoline/water mixtures 30 times. d) SEM image of the mesh after separating diesel/water mixtures 30 times.

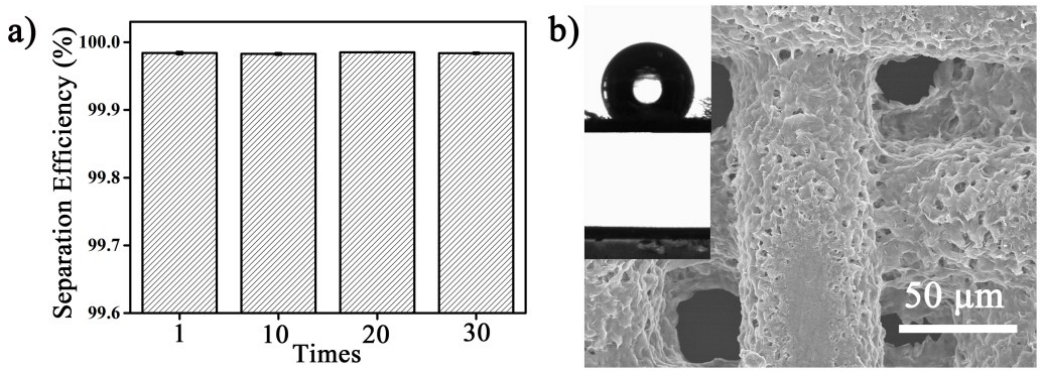

Fig. S5 a) Oil/water mixtures separation efficiencies of the recycled gloves PE coated mesh after recycle use; b) Contact angle and SEM image of the mesh after 30 times oil/water separation.

Video:
Video S1: oil/water separation by the recycled gloves PE coated mesh.