

Supporting Information

Multifunctional carbon fibers from chemical upcycling of mask waste

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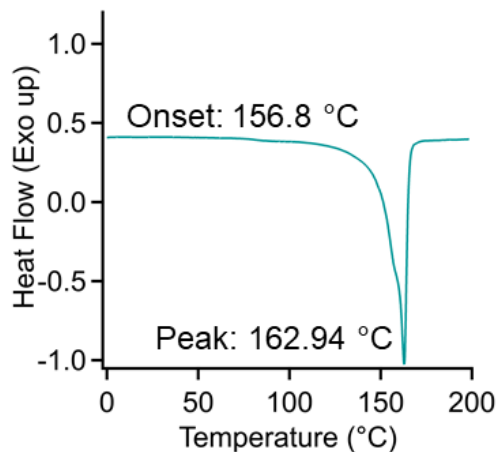


Figure S1. DSC thermogram of untreated PP mask exhibiting an onset of melting at 156.8 °C and a melting peak at 162.94 °C.

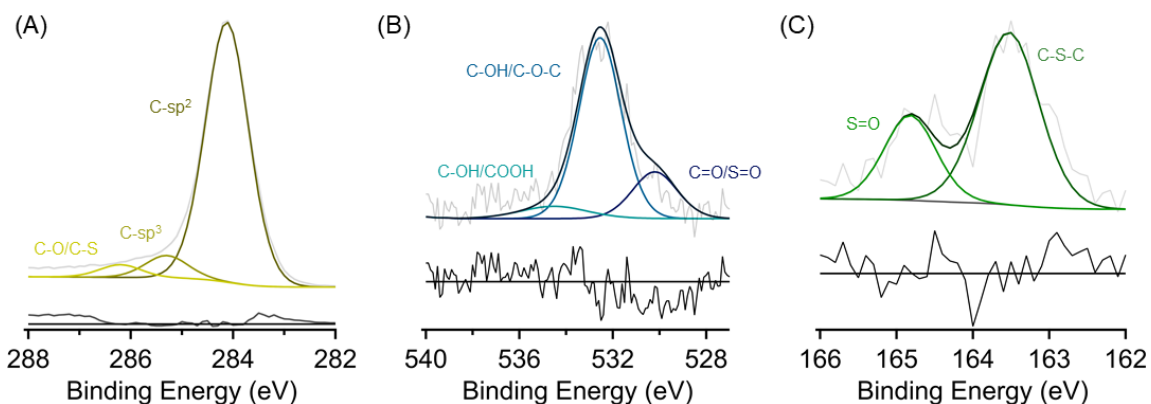


Figure S2. High resolution XPS scans for (A) carbon, (B) oxygen, and (C) sulfur. Raw data, fitting peaks and residuals are also included.

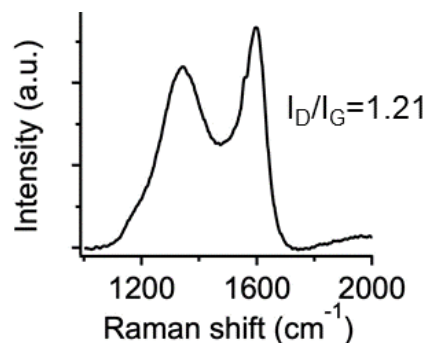


Figure S3. Raman spectrum of carbonized fibers highlighting the disordered and graphitic bands.

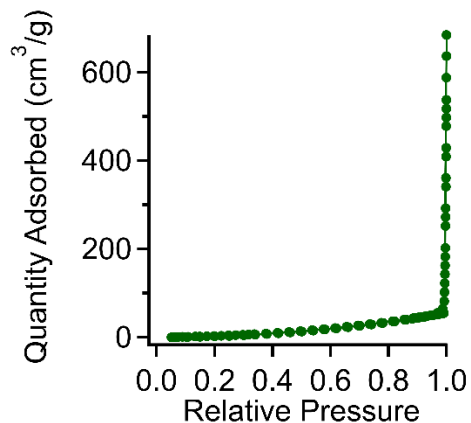


Figure S4. Nitrogen adsorption isotherm of a sulfonated mask prior to carbonization. The low amount of adsorbed N_2 at relative pressures between 0.0 and 0.1 indicates the absence of micropores.

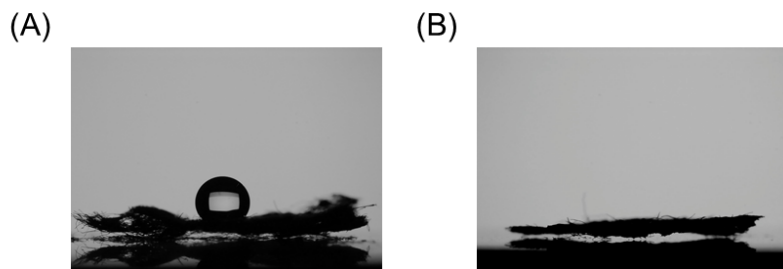


Figure S5. Water contact angle measurement (A) of a carbonized mask exhibiting a contact angle of 130° , indicating hydrophobic character. (B) Contact angle of toluene on the carbonized mask where the drop is not visible because it has completely wet the mask fibers.

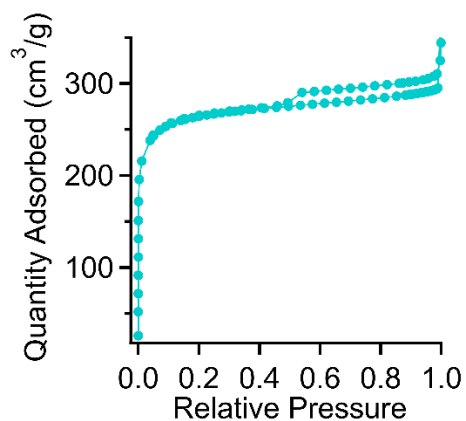


Figure S6. Nitrogen adsorption isotherm of a commercially available powder activated carbon exhibiting similar surface area to the carbonized mask fibers.

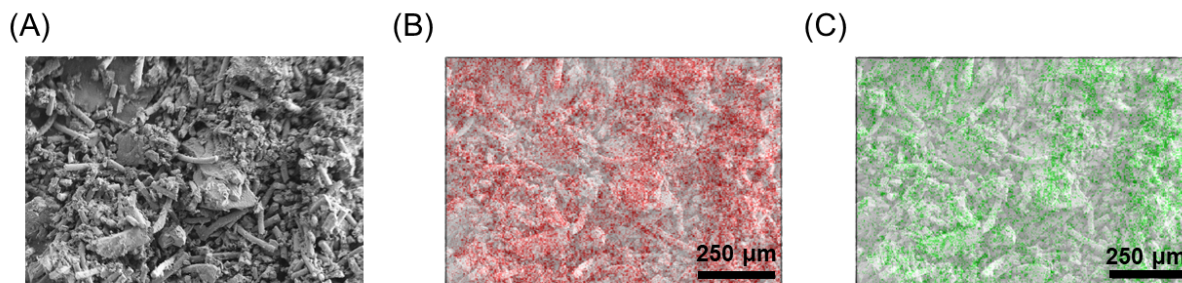


Figure S7. (A) SEM image of activate mask fibers. Overlaid SEM images with EDX maps corresponding to (B) sulfur (6.9 wt%) and (C) oxygen (25.6 wt%).

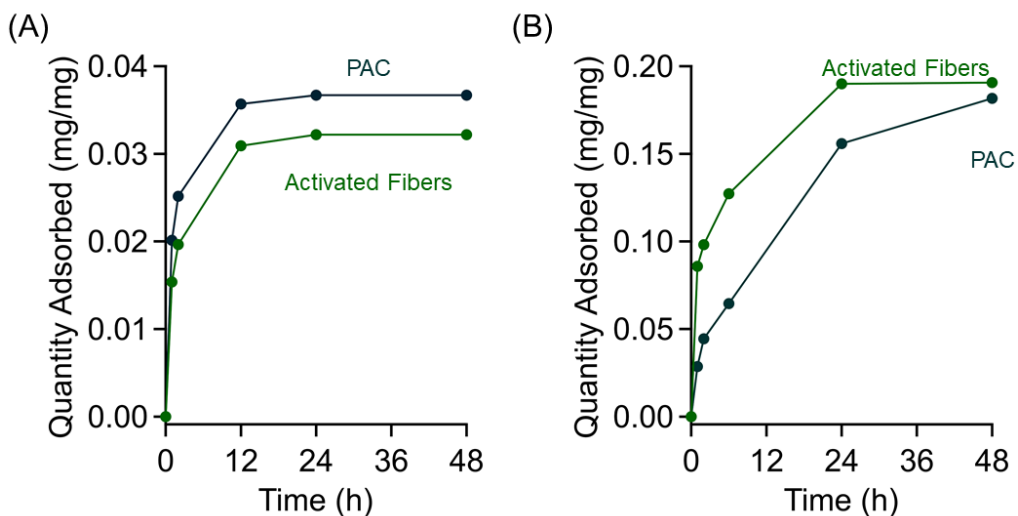


Figure S8. Dye adsorption capacities of PAC and activated fibers in 0.07 mg/mL (A) and 0.30 mg/mL (B) of basic blue 17 in water.

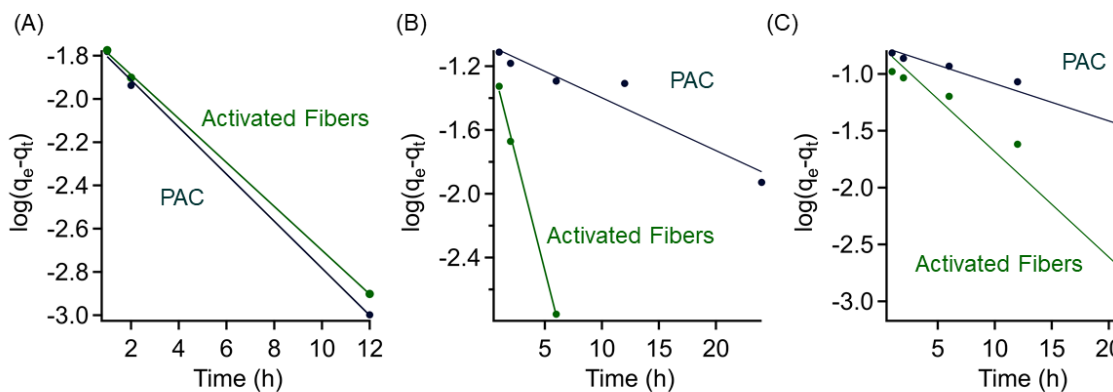


Figure S9. Dye adsorption kinetics of basic blue 17 on powder activated carbon (PAC) and the activated fibers in 0.07 mg/mL (A), 0.15 mg/mL (B), and 0.30 mg/mL (C) solutions