

Three-Dimensional Printing of Recycled Polypropylene and Activated Carbon Coatings for Harmful Gas Adsorption and Antibacterial Properties

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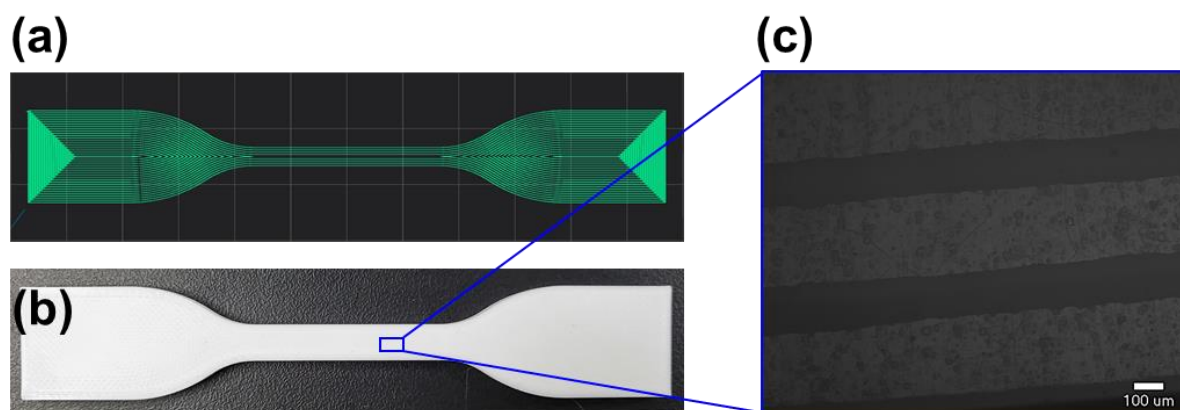


Figure S1. (a) 3D printing profile, (b) Photo image, and (c) optical microscopy image of 3D printed dogbone.

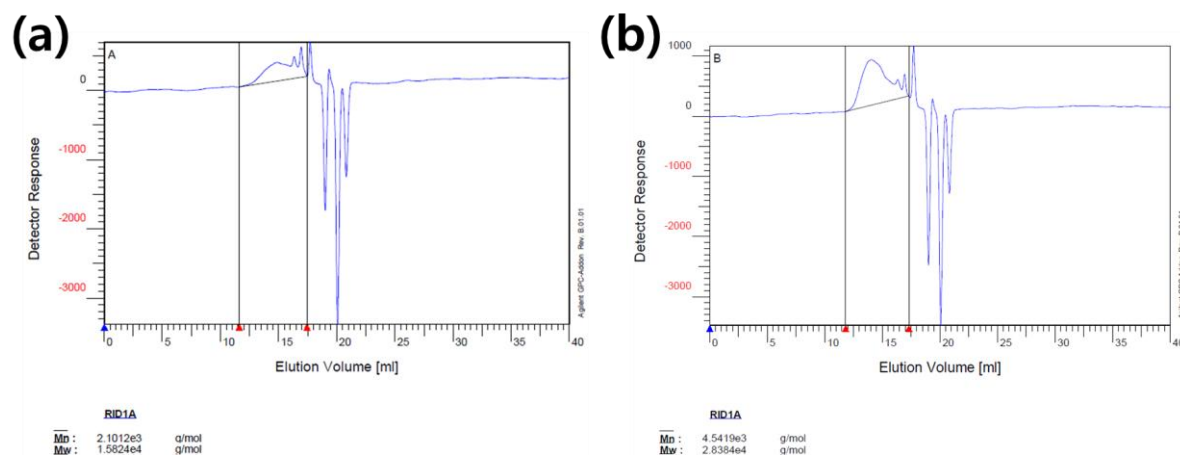


Figure S2. GPC traces of (a) virgin PP filament and (b) rPP filament.

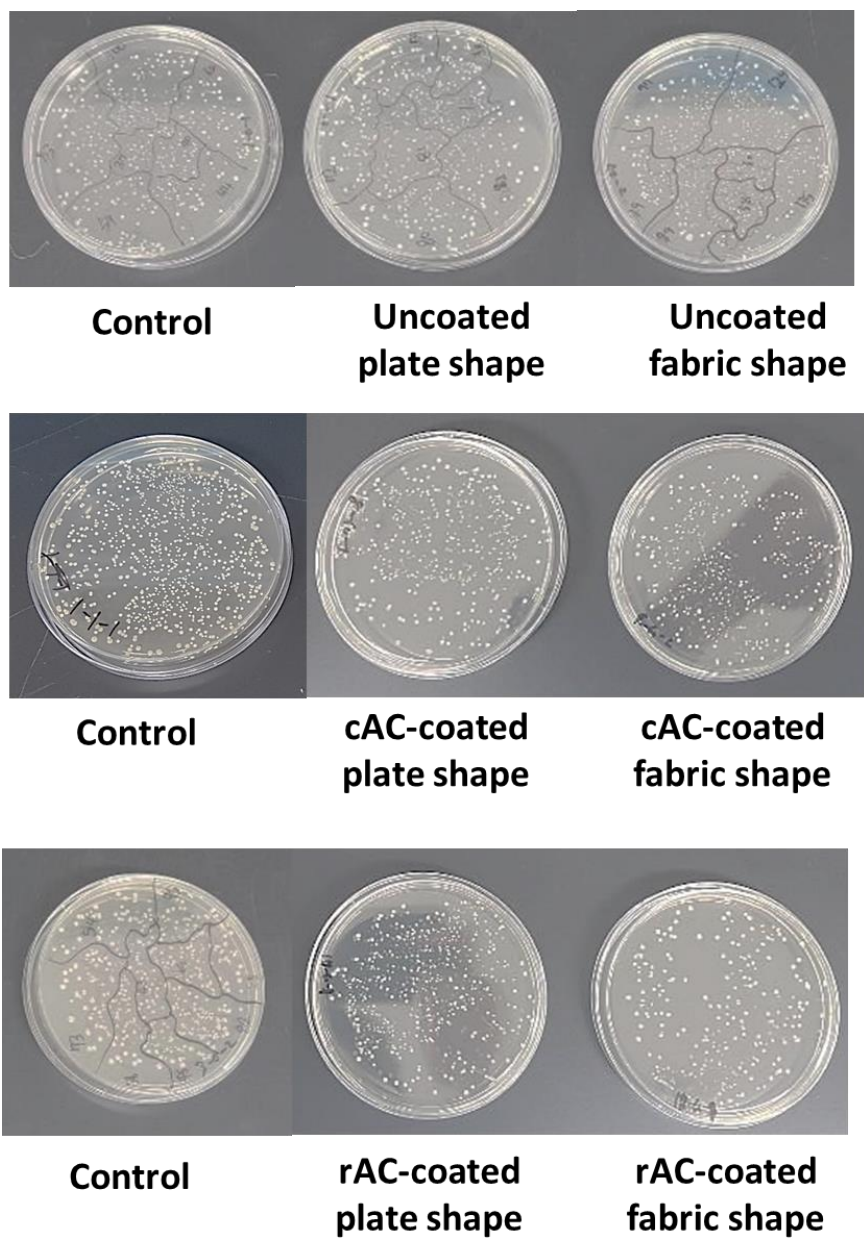


Figure S3. Photo images of antibacterial tests of uncoated and AC-coated 3D filters.

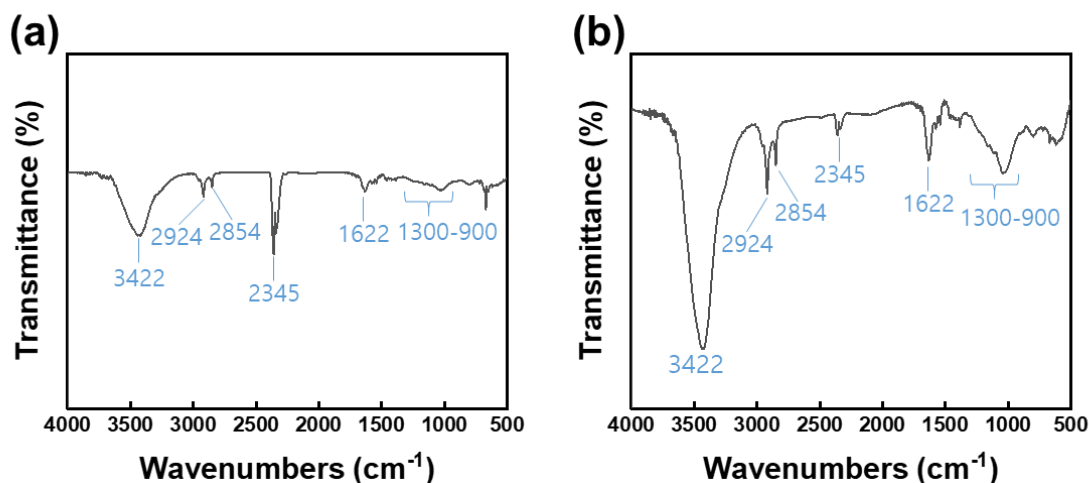


Figure S4. FT-IR spectra of (a) cAC and (b) rAC.

FT-IR analysis was used for identifying surface functional groups of the cAC and rAC. When the spectrum of the rAC is compared with that of the cAC spectrum, it reveals that three characteristic bands corresponding to O–H stretching (3422 cm^{-1}), C=O stretching (1622 cm^{-1}), and C–O stretching vibrations ($1300\text{--}900 \text{ cm}^{-1}$) of the rAC specimen are much larger than those of the cAC specimen. On the other hand, the C=C peak (2345 cm^{-1}) of the cAC is larger than that of the rAC. Therefore, it can be concluded that the rAC contains a larger amount of oxygen-containing functional groups than the cAC specimen.

References

1. Mojoudi, N.; Mirghaffari, N.; Soleimani, M.; Shariatmadari, H.; Belver, C.; Bedia, J. Phenol adsorption on high microporous activated carbons prepared from oily sludge: equilibrium, kinetic and thermodynamic studies. *Sci. Rep.* **2019**, *9*, 19352. <https://doi.org/10.1038/s41598-019-55794-4>.