

POSTER ABSTRACTS

Surface Area and Toluene Adsorption Capacity for Fabricated Single-Walled Carbon Nanotube (SWNT) Buckypaper

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To use single-walled carbon nanotubes (SWNTs) in volatile organic compound (VOC) passive samplers, SWNT buckypaper were fabricated in three different ways and their adsorption efficiencies were examined. 200 mL of the SWNT solution (arc discharge SWNTs suspended in 1% sodium cholate and sodium dodecyl sulfate) was diluted in 400 mL of acetone, vacuum-filtered through a polytetrafluoroethylene membrane filter, and buckypaper was obtained by delaminating the layer of SWNTs from the filter (not cleaned). A cleaning process was added to the above fabrication process. After SWNT solution was vacuum-filtered, SWNTs on the filter were cleaned with 250 mL of deionized water and 50 mL of acetone (acetone-cleaned). As another cleaning process, methanol was used to dilute and clean SWNTs (methanol-cleaned). The fabricated buckypapers were investigated for surface area and toluene adsorption isotherm. As a result, the cleaning process increased BET surface area; 43, 217, and 348 m²/g Brunauer, Emmett and Teller (BET) surface area for not cleaned, acetone-, and methanol-cleaned buckypapers, respectively. The adsorption capacity increased with increasing surface area of buckypapers; 52, 58, and 69 mg (toluene)/g (buckypaper) for not cleaned, acetone-, and methanol-cleaned buckypapers, respectively. Methanol-cleaned buckypapers were the most adsorptive, hinting for further investigation in desorption efficiency for the application to VOC passive samplers.



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