

Hydrophobic Mesoporous Adsorbent based on Cyclic Amine - Divinylbenzene Copolymer for Highly Efficient Siloxane Removal

Iman Noshadi^{1,2,3‡}, Baishali Kanjilal^{4‡}, Tahereh Jafari⁴, Ehsan Moharreri⁴, Nasser Khakpash⁵,
Ting Jiang¹, Steven L. Suib^{1,4,5,6,*}

1 Department of Chemicals, Materials & Biomolecular Engineering, University of Connecticut, 91 North Eagleville Road, Storrs, Connecticut 06269-3222, United States

2 Harvard-MIT Health Science and Technology, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, 02139, United States

3 Wyss Institute for Biologically Inspired Engineering, Harvard University, MA, 02115, United States

4 Institute of Materials Science, University of Connecticut, 91 North Eagleville Road, Storrs, Connecticut 06269-3222, United States

5 Department of Materials Science and Engineering, University of Connecticut, 97 North Eagleville Road, Storrs, Connecticut 06269-5233, United States

6* Department of Chemistry, University of Connecticut, 55 North Eagleville Road, Storrs, Connecticut 06269-3060, United States

NMR spectroscopy (a) Allylcyclohexylamine raw material (b) Thiolene click adduct intermediate (c) Methacrylate Monomer (ACAM) (Figure S1), GC of washed and diluted commercial activated charcoal and P(DVB-ACAM). Inset: GC pattern of D4-standard solution of 10 ppm used for to show the specific time of D4 elution (5.78 second) (Figure S2), FTIR of P(DVB-ACAM) before and after adsorption (b) expanded inset 650 – 1250 cm^{-1} (c) expanded inset 1000 – 1400 cm^{-1} (d) expanded inset 2500 – 3300 cm^{-1} (Figure S3), XPS analysis (Screen Shot) for P(DVB-ACAM) after D4 siloxane adsorption process (Figure S4), BET of P(DVB-ACAM) before and after 10 cycles regeneration from D4 adsorption (Figure S5), FTIR of P(DVB-ACAM) before and after 10 cycles regeneration from D4 adsorption (Figure S6).

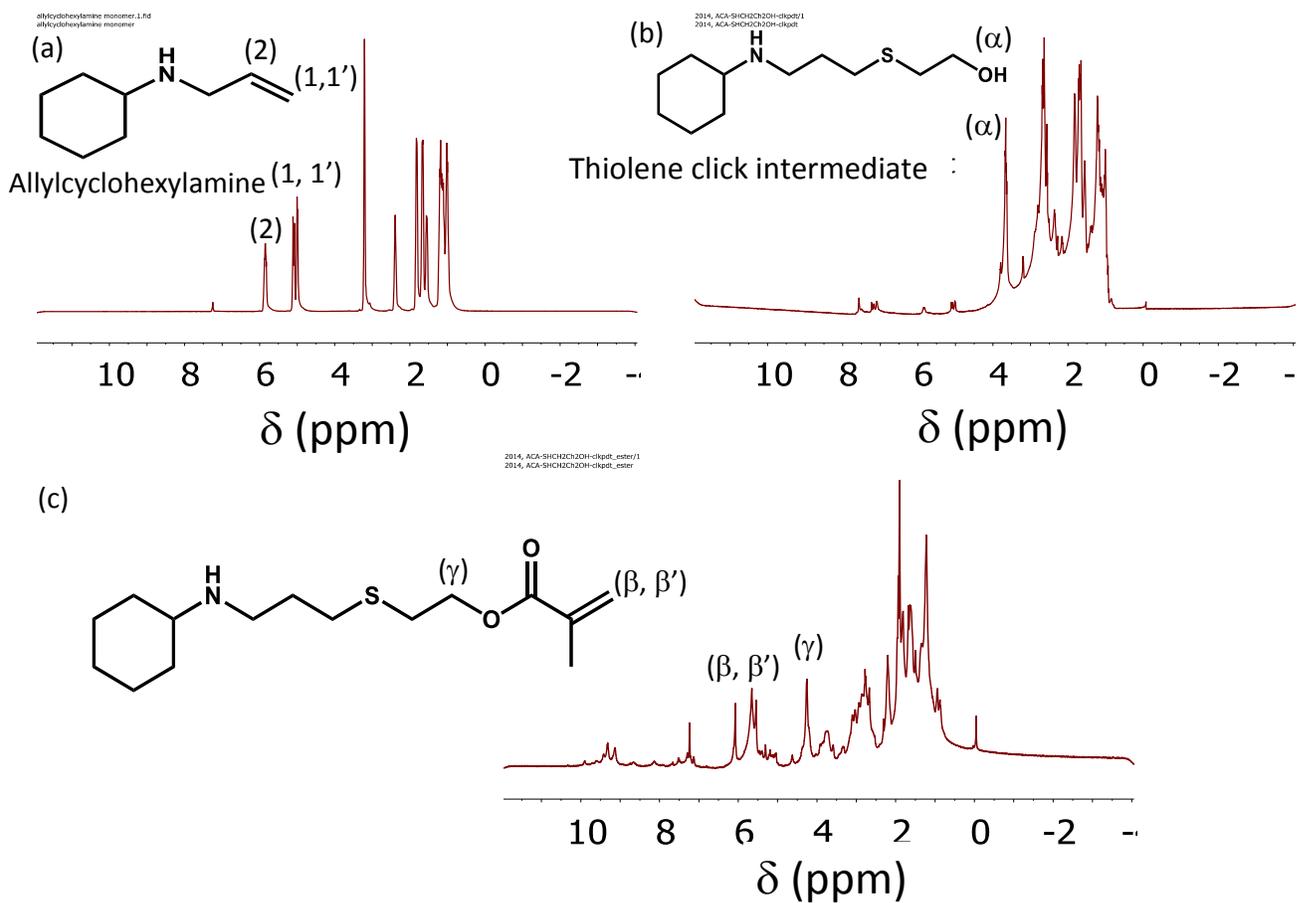


Figure S1. NMR spectroscopy (a) Allylcyclohexylamine raw material (b) Thiolene click adduct intermediate (c) Methacrylate Monomer (ACAM).

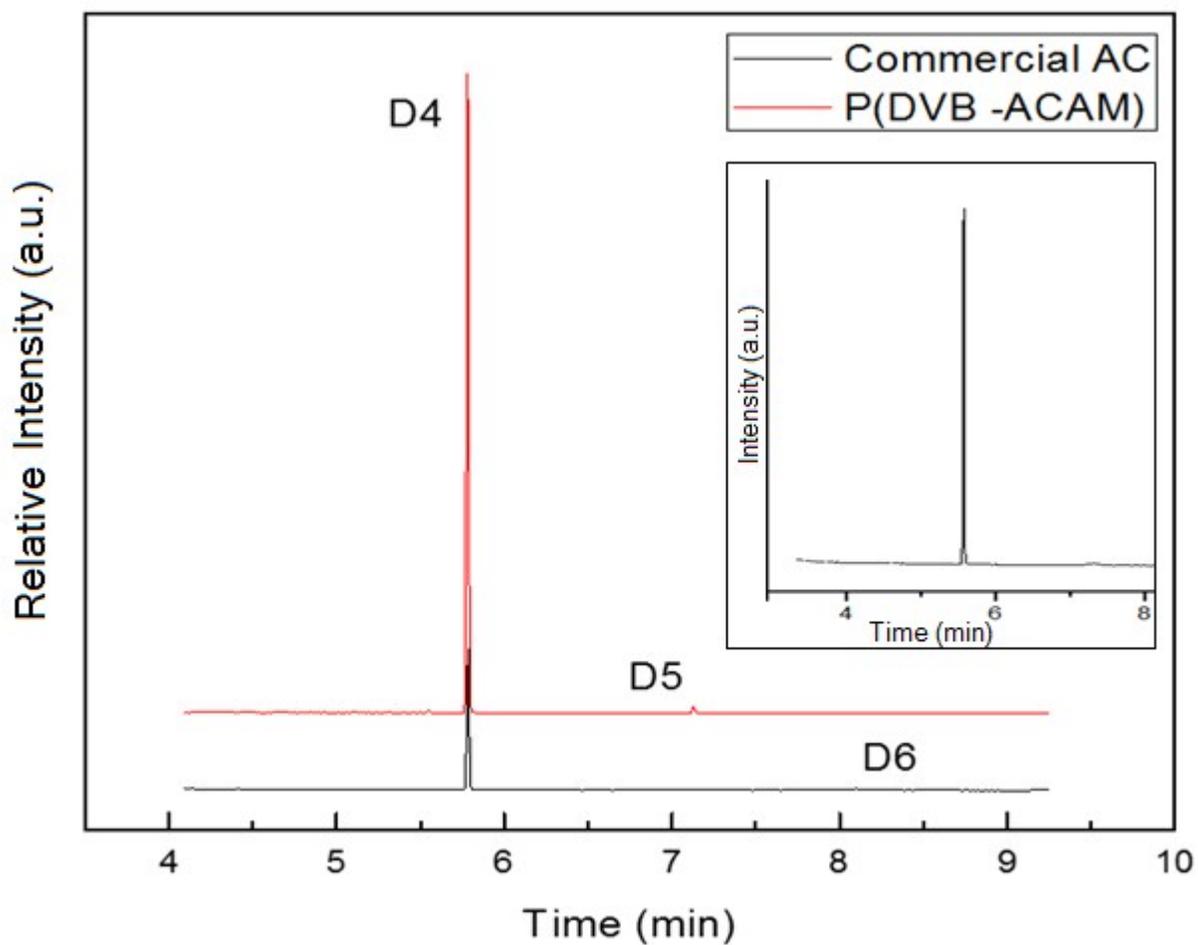


Figure S2. GC of washed and diluted commercial activated charcoal and P(DVB-ACAM). Inset: GC pattern of D4-standard solution of 10 ppm used to show the specific time of D4 elution (5.78 second).

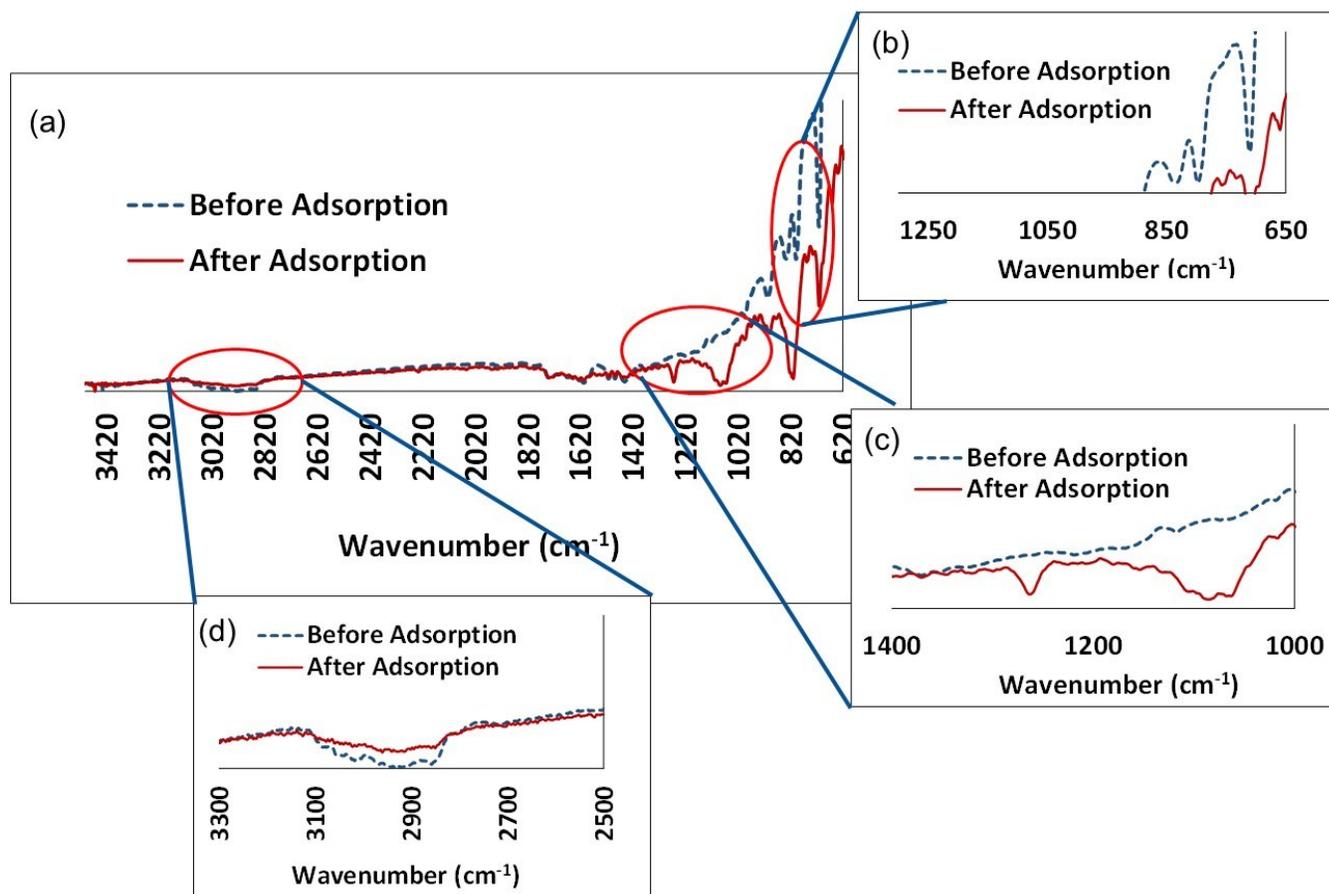


Figure S3: (a) FTIR of P(DVB-ACAM) before and after adsorption (b) expanded inset 650 – 1250 cm^{-1} (c) expanded inset 1000 – 1400 cm^{-1} (d) expanded inset 2500 – 3300 cm^{-1}

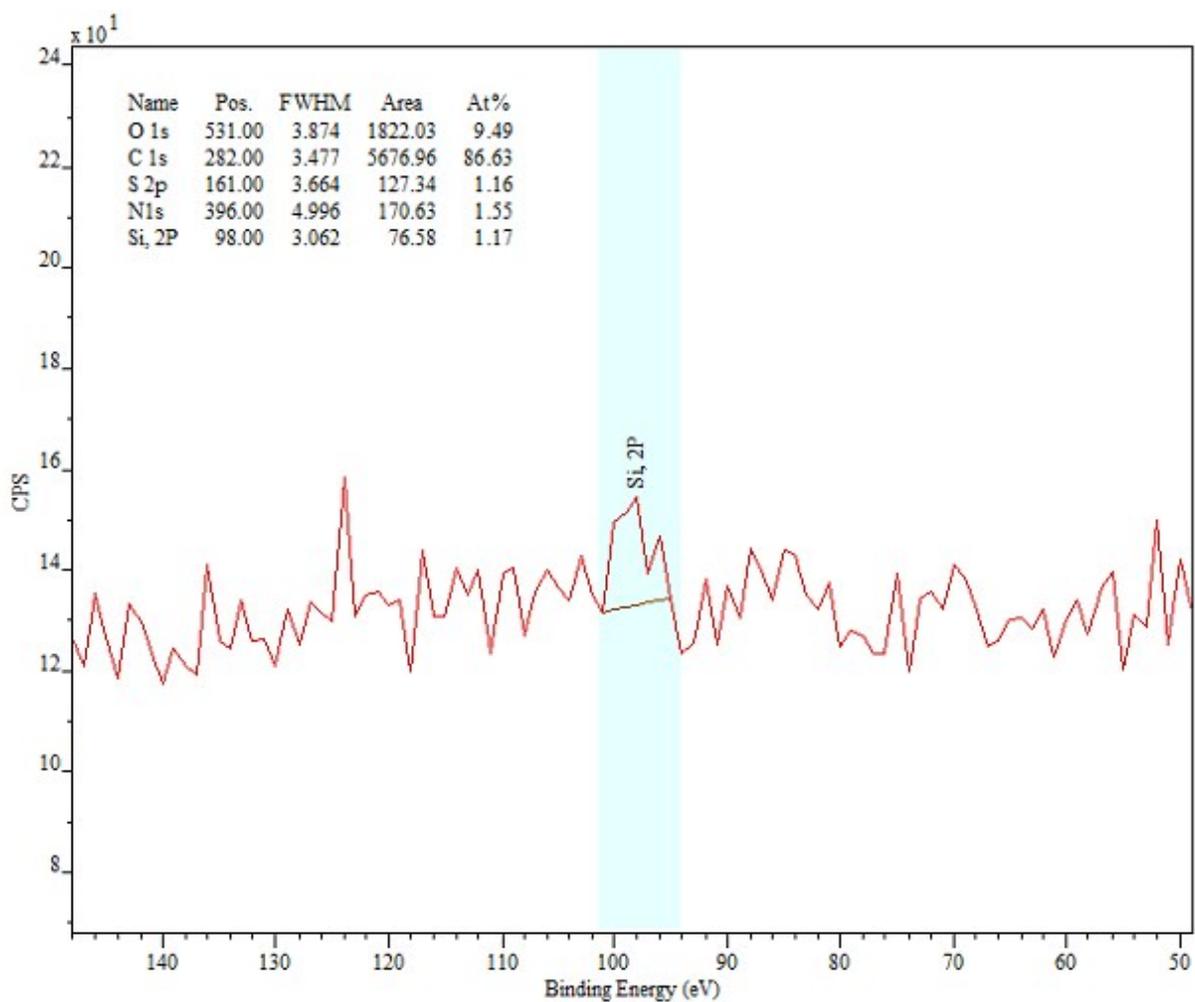


Figure S4: XPS analysis (Screen Shot) for P(DVB-ACAM) after D4 siloxane adsorption process

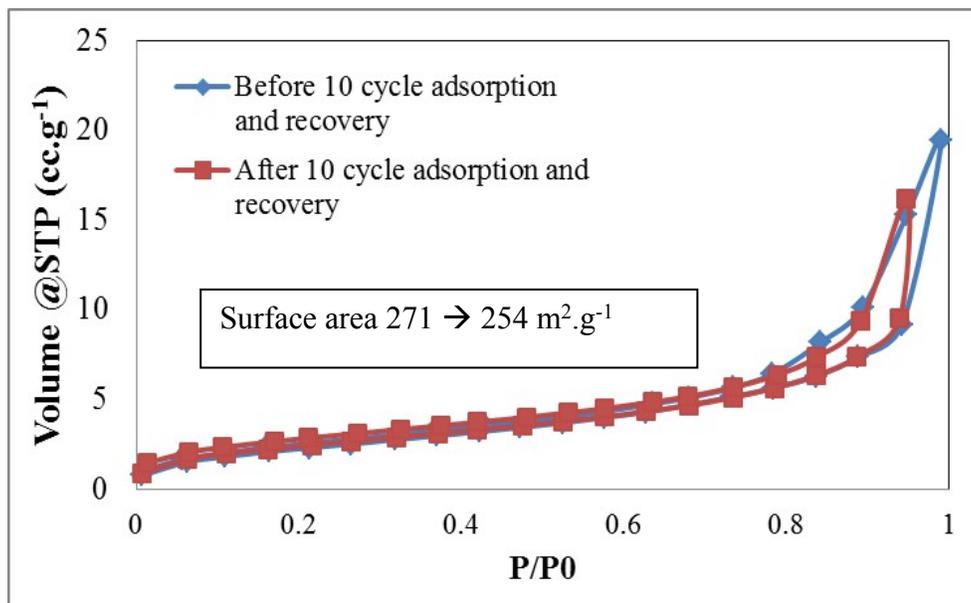


Figure S5: BET of P(DVB-ACAM) before and after 10 cycles regeneration from D4 adsorption.

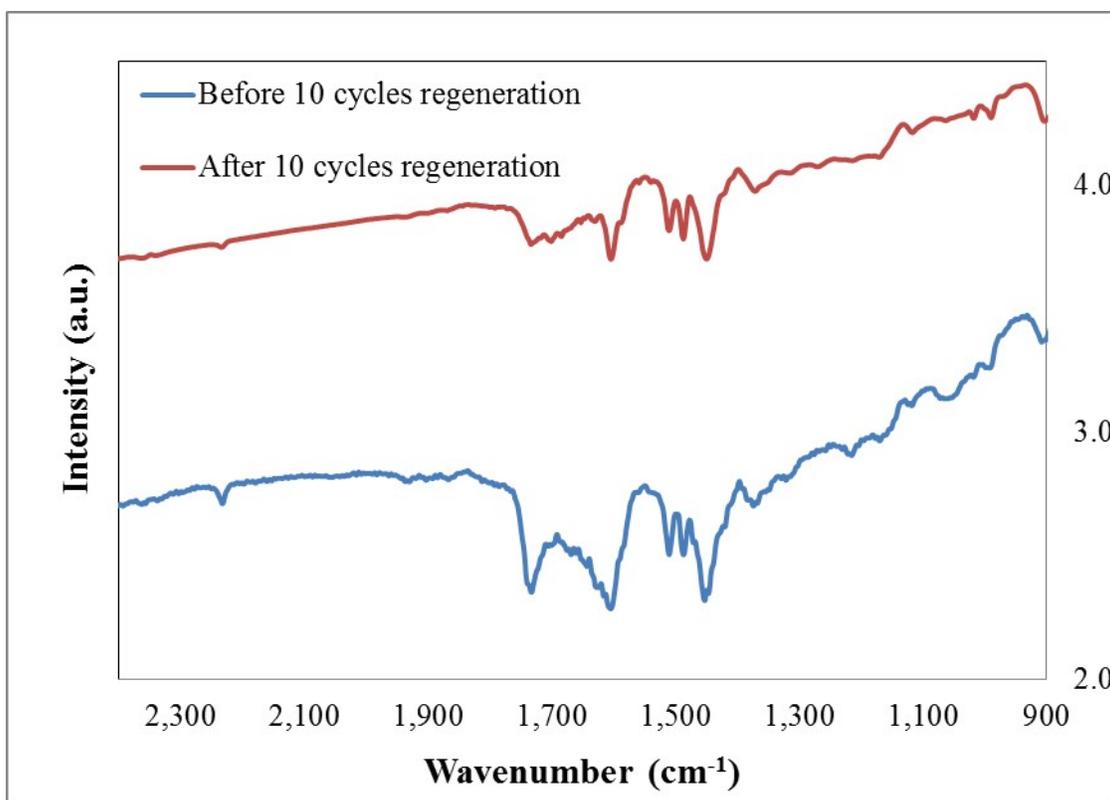


Figure S6: FTIR of P(DVB-ACAM) before and after 10 cycles regeneration from D4 adsorption.