Supporting Information

Hydride Abstraction Initiated Hydrosilylation of Terminal Alkenes and Alkynes on Hydride-Terminated Porous Silicon

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FTIR data for alkenes/alkynes (those not shown in figures) after reaction with porous silicon through hydride abstraction initated hydrosilylation:

1-Hexene (1): 2960 and 2878 cm^{-1} $\nu(CH_3)$, 2924 and 2855 cm^{-1} $\nu(CH_2)$, 2108 cm^{-1} $\nu(SiH_2)$, 2089 cm^{-1} $\nu(SiH)$, 1465 cm^{-1} $\delta(CH_2)$, 1457 cm^{-1} $\delta(CH_3)$, 1059 cm^{-1} $\nu(SiO)$, 907 cm^{-1} $\delta(SiH_2)$, 665 cm^{-1} $\delta(SiH)$, 629 cm^{-1} $\delta(SiH_2)$.

1H, 1H, 2H-Perfluoro-1-octene (2): 2982, 2936, and 2882 cm^{-1} $\nu(CH_x)$, 2108 cm^{-1} $\nu(SiH_x)$, 1362 cm^{-1} $\nu(CF_3)$, 1244, 1210, 1146, and 1121 cm^{-1} $\nu(CF_2)$, 1067 cm^{-1} $\nu(SiO)$, 905 cm^{-1} $\delta(SiH_2)$, 663 cm^{-1} $\delta(SiH)$, 630 cm^{-1} $\delta(SiH_2)$.

1-Dodecyne (3): 3070 and 3031 cm^{-1} $\nu(ArH)$, 2958 and 2873 cm^{-1} $\nu(CH_3)$, 2924 and 2854 cm^{-1} $\nu(CH_2)$, 2109 cm^{-1} $\nu(SiH_2)$, 2089 cm^{-1} $\nu(SiH)$, 1601 cm^{-1} $\nu(SiC{=}C)$, 1495 cm^{-1} $\nu(Ar)$, 1465 cm^{-1} $\delta(CH_x)$, 1379 cm^{-1} $\delta(CH_3)$, 1073 cm^{-1} $\nu(SiO)$, 979 cm^{-1} $\gamma(HC{=}C)$, 906 cm^{-1} $\delta(SiH_2)$, 698 cm^{-1} $\gamma(ArH)$, 664 cm^{-1} $\delta(SiH)$, 629 cm^{-1} $\delta(SiH_2)$.

1,7-Octadiene (4): 3082 cm^{-1} $\nu(=CH_2)$, 3031 cm^{-1} $\nu(ArH)$, 2926 and 2855 cm^{-1} $\nu(CH_2)$, 2106 cm^{-1} $\nu(SiH_x)$, 1642 cm^{-1} $\nu(C{=}C)$, 1600 and 1496 cm^{-1} $\nu(Ar)$, 1456 cm^{-1} $\delta(CH_2)$, 1065 cm^{-1} $\nu(SiO)$, 993 cm^{-1} $\gamma(=CH_2)$, 908 cm^{-1} $\delta(SiH_2)$, 698 cm^{-1} $\gamma(ArH)$, 664 cm^{-1} $\delta(SiH)$, 630 cm^{-1} $\delta(SiH_2)$.

1,7-Octadiyne (5): 3309 cm^{-1} $\nu(\equiv CH)$, 3068 and 3029 cm^{-1} $\nu(ArH)$, 2938 and 2864 cm^{-1} $\nu(CH_2)$, 2107 cm^{-1} $\nu(SiH_2)$, 2082 cm^{-1} $\nu(SiH)$, 1602 cm^{-1} $\nu(SiC{=}C)$, 1496 cm^{-1} (Ar), 1457 cm^{-1} $\delta(CH_2)$, 1078 cm^{-1} $\nu(SiO)$, 981 cm^{-1} $\gamma(=CH)$, 907 cm^{-1} $\delta(SiH_2)$, 699 cm^{-1} $\gamma(ArH)$, 663 cm^{-1} $\delta(SiH)$, 630 cm^{-1} $\delta(SiH_2)$.

Styrene (8): 3104, 3083, 3061, 3026, and 3004 cm^{-1} $\nu(ArH)$, 2977, 2926, 2881, and 2854 cm^{-1} $\nu(CH_x)$, 2105 cm^{-1} $\nu(SiH_x)$, 1602, 1494, and 1452 cm^{-1} $\nu(Ar)$, 1068 cm^{-1} $\nu(SiO)$, 906 cm^{-1} $\delta(SiH_2)$, 698 cm^{-1} $\gamma(ArH)$, 664 cm^{-1} $\delta(SiH)$, 629 cm^{-1} $\delta(SiH_2)$.

5-Chloro-1-pentyne (9): 3070 and 3032 cm^{-1} $\nu(ArH)$, 2978, 2959, and 2879 cm^{-1} $\nu(CH_x)$, 2106 cm^{-1} $\nu(SiH_x)$, 1602 cm^{-1} $\nu(SiC{=}C)$, 1495 cm^{-1} $\nu(Ar)$, 1066 cm^{-1} $\nu(SiO)$, 979 cm^{-1} $\gamma(=CH)$, 904 cm^{-1} $\delta(SiH_2)$, 700 cm^{-1} $\gamma(ArH)$, 660 cm^{-1} $\delta(SiH)$, 630 cm^{-1} $\delta(SiH_2)$.

Figure SI1. Transmission FTIR spectra of dodecenyl-functionalized porous silicon immersed in boiling aerated basic (pH 10) 25% EtOH (*aq*) for 30 min. (a) Functionalized sample prepared by Lewis acid mediated hydrosilylation. (b) Functionalized sample prepared by carbocation-mediated hydrosilylation. (c) Unfunctionalized (hydride-terminated) sample. No Si-H_x features are evident, indicating dissolution of the porous layer.

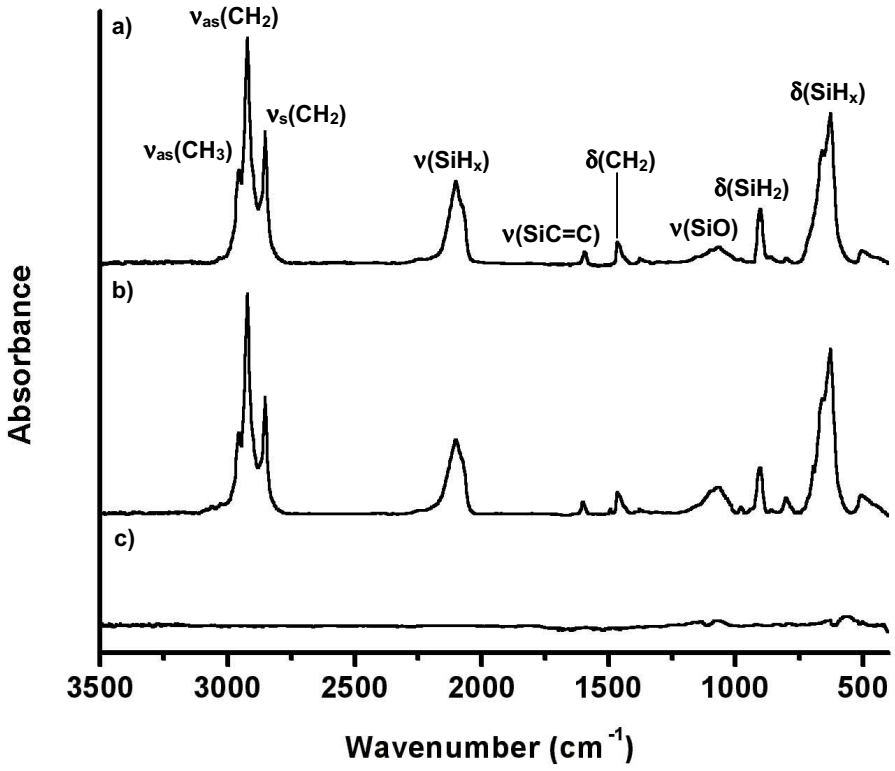

Figure SI2. Transmission FTIR spectra of dodecenyl-functionalized porous silicon prepared by hydride-abstraction initiated hydrosilylation with 1-dodecyne using Ph_3CBF_4. (top) A dodecenyl-derivatized surface. (bottom) The sample from (a) upon hydroboration with BH_3·THF for 16 h and quenching with $EtOH/H_2O$.