Supporting information for

Amine-Functionalized Siloxane Oligomer Facilitated Synthesis of Subnanometer Colloidal Au Particles.

Zhen Wang, Evgeny V. Beletskiy, Sungsik Lee, Yuyang Wu, Tiehu Li, Mayfair C. Kung, and Harold H. Kung.

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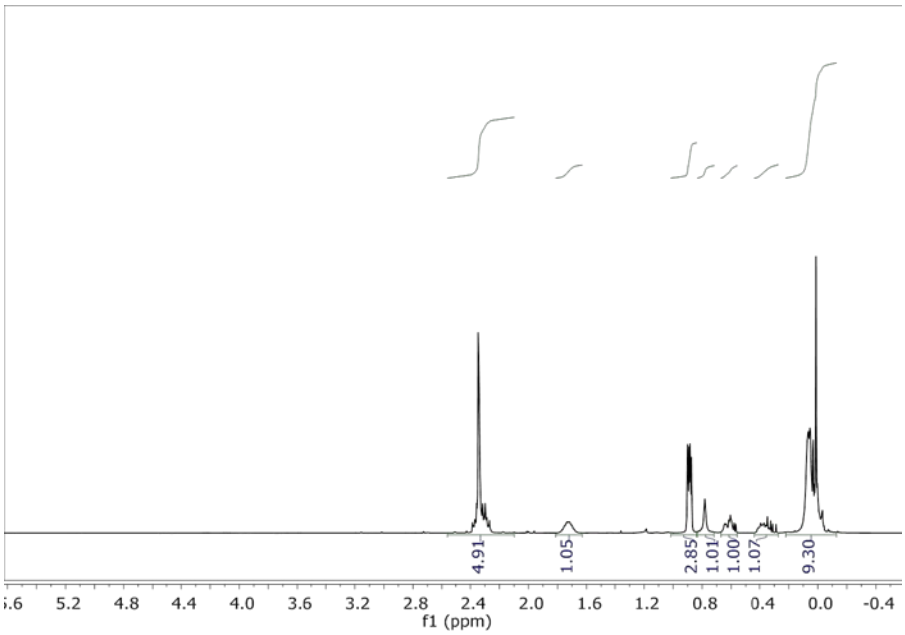

Figure S-1a. ^{1}H NMR of N-PMHS **IV**.

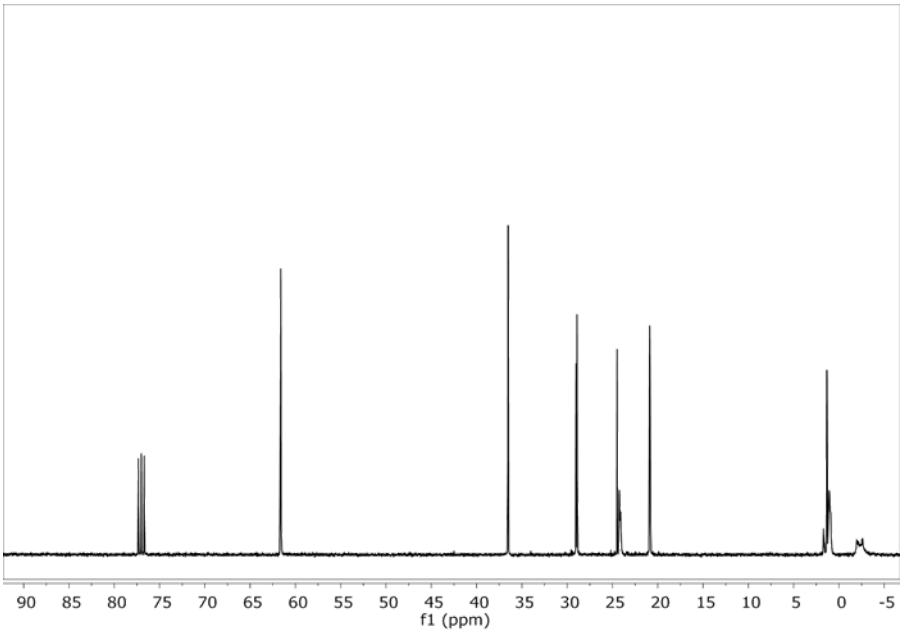

Figure S-1b. ^{13}C NMR of N-PMHS **IV**.

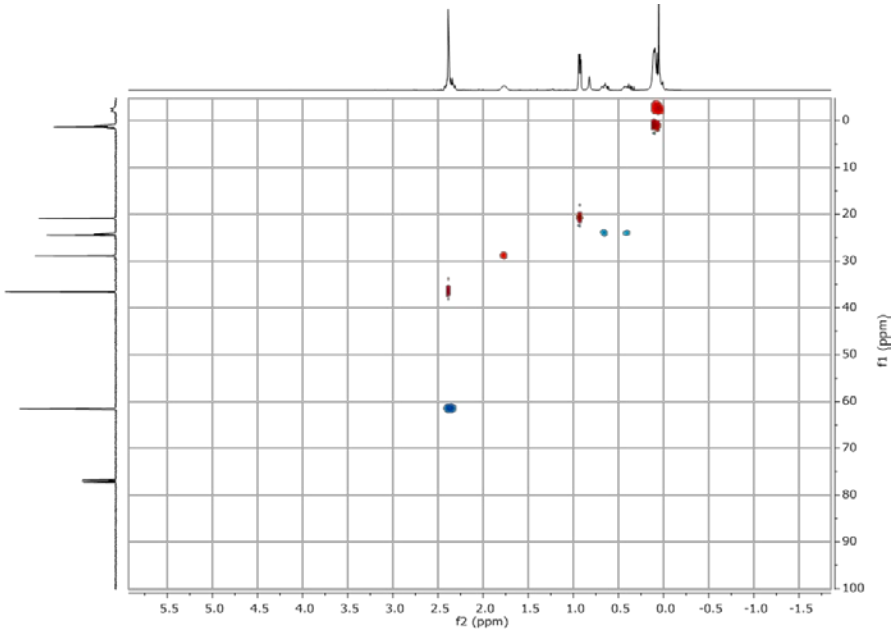

Figure S-1c. HSQCAD of N-PMHS **IV**.

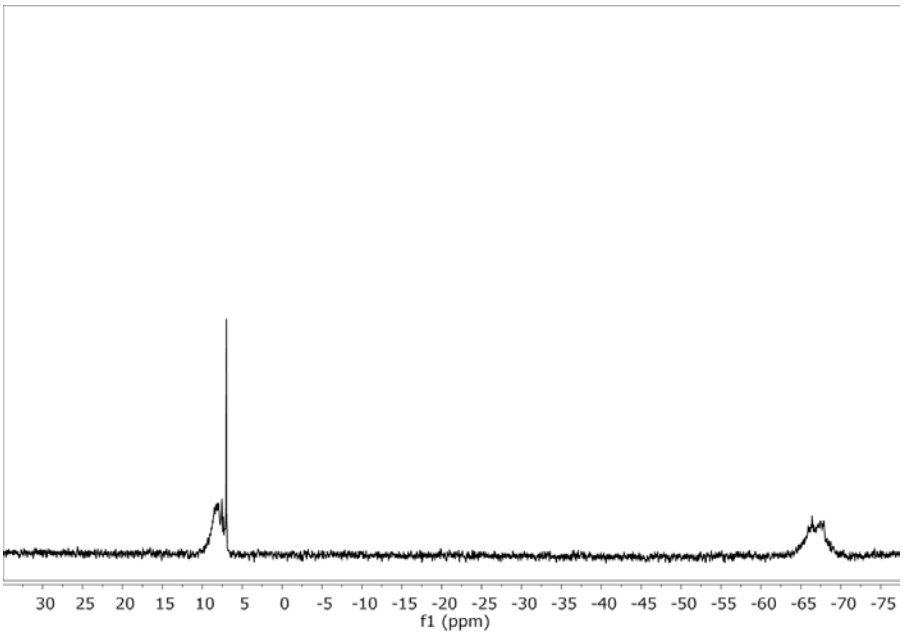

Figure S-1d. ^{29}Si NMR of -PMHS **V**.

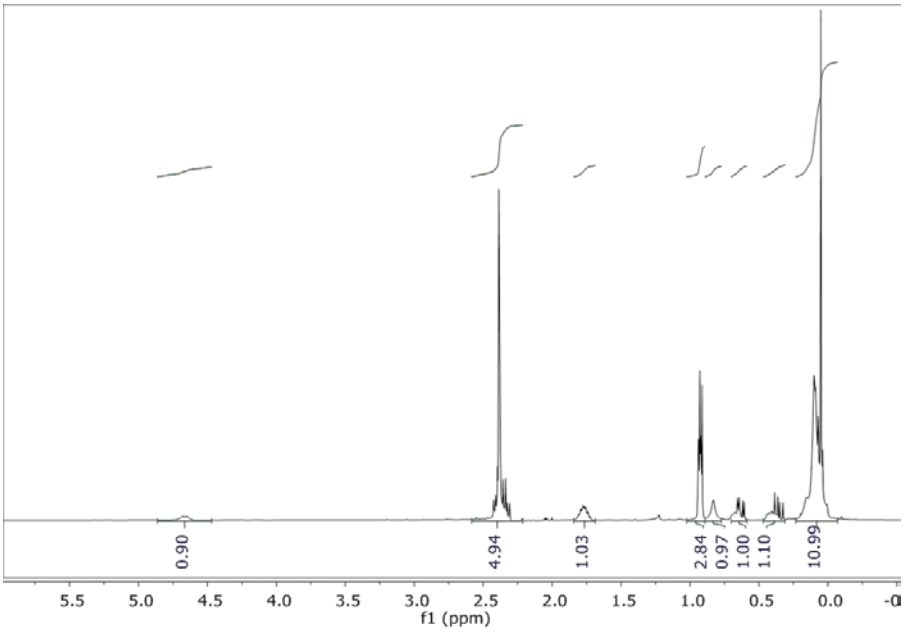

Figure S-2a. ^{1}H NMR of N-SiH-PMHS **V**.

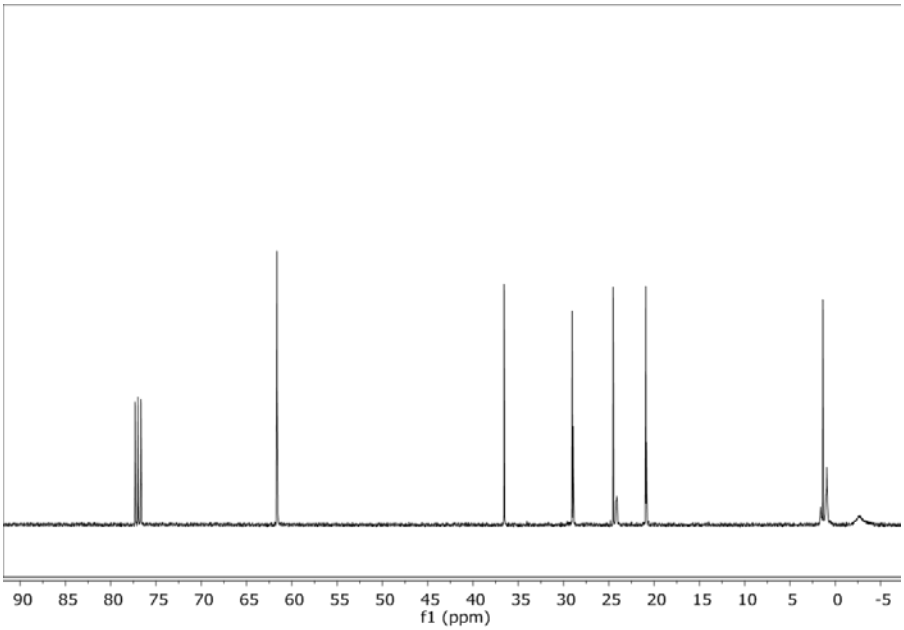

Figure S-2b. ^{13}C NMR of N-SiH-PMHS **V**.

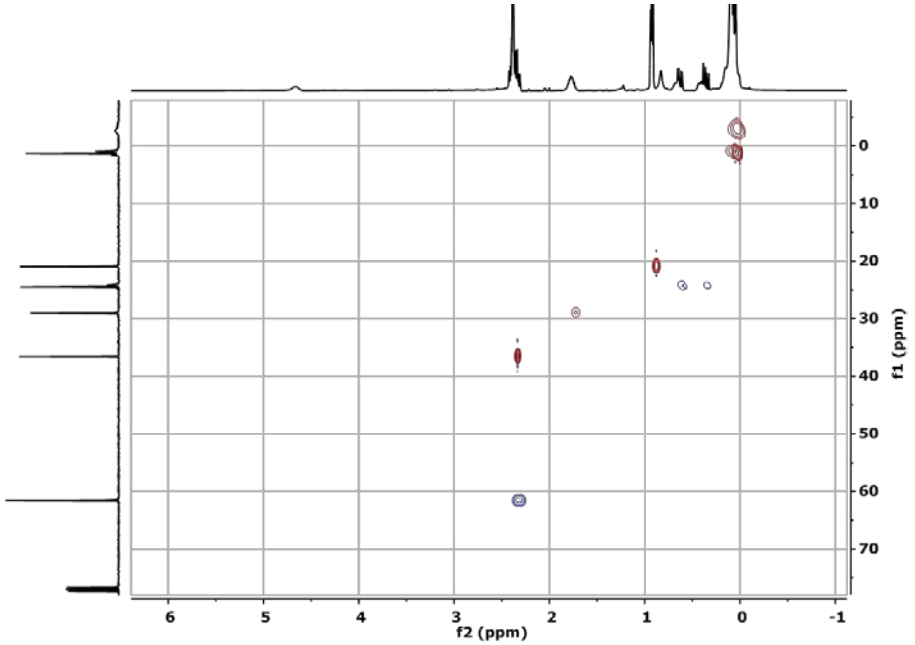

Figure S-2c. HSQCAD of N-SiH-PMHS **V**.

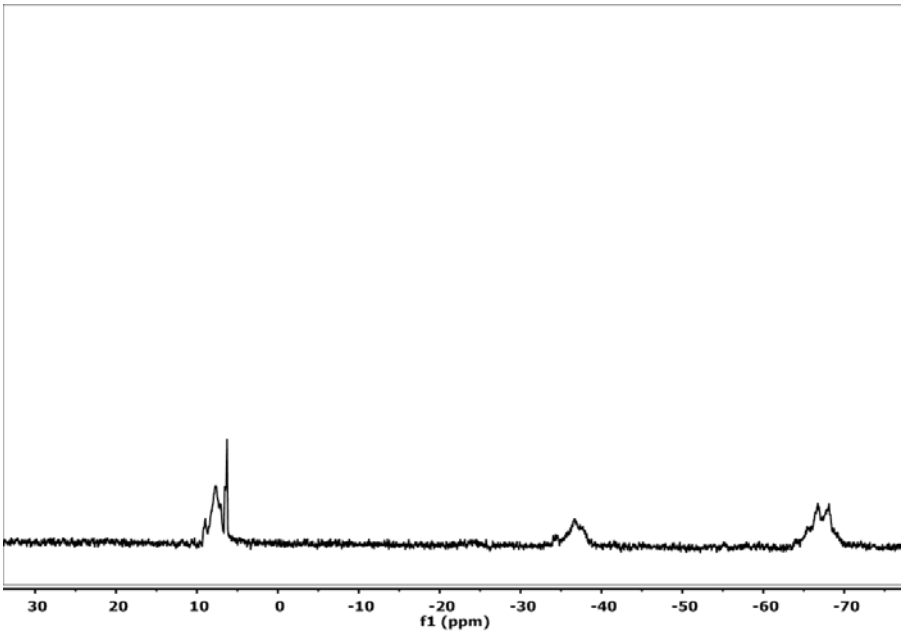

Figure S-2d. ^{29}Si NMR of N-SiH-PMHS **V**.

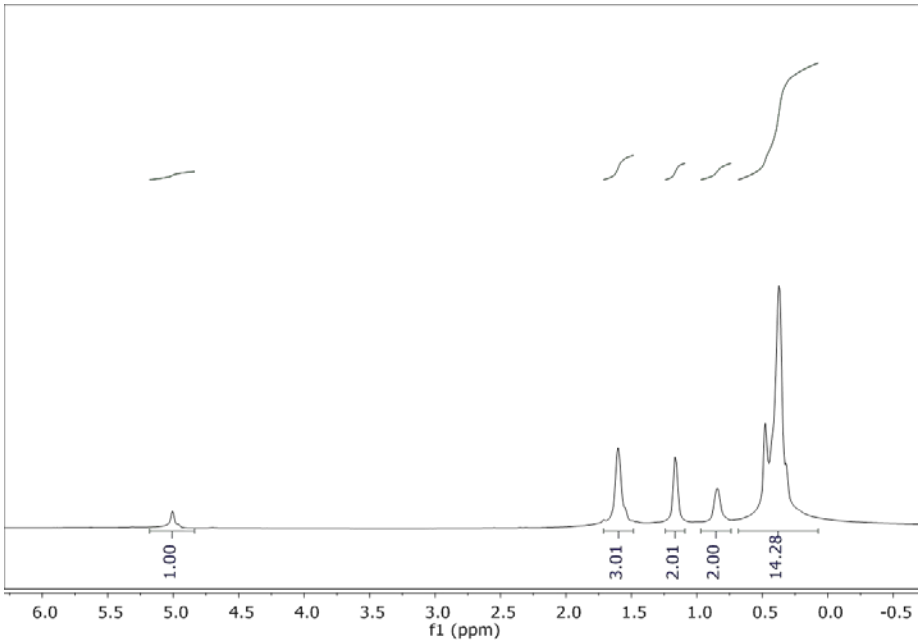

Figure S-3a. ^{1}H NMR of Me-SiH-PMHS **VI**.

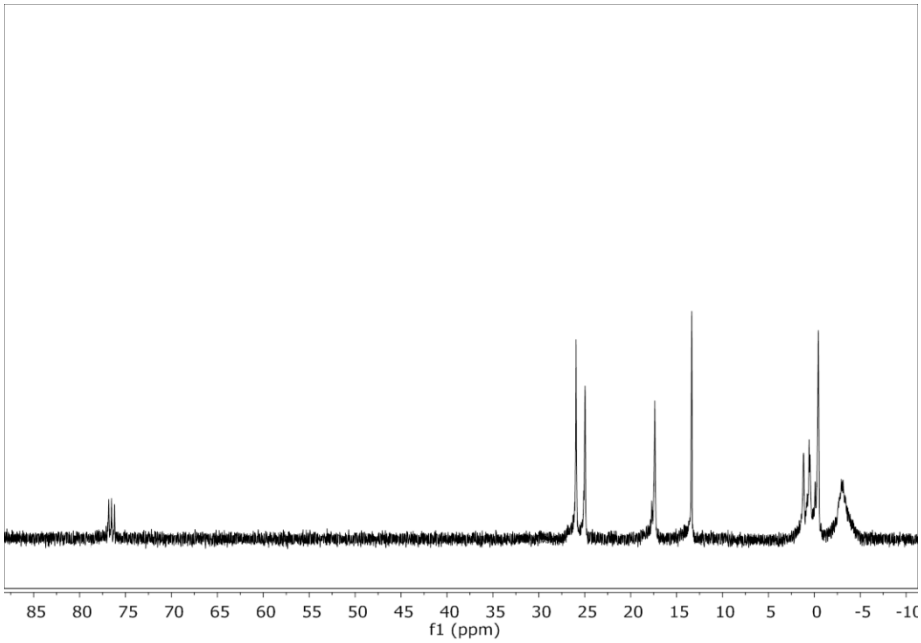

Figure S-3b. ^{13}C NMR of Me-SiH-PMHS **VI**.

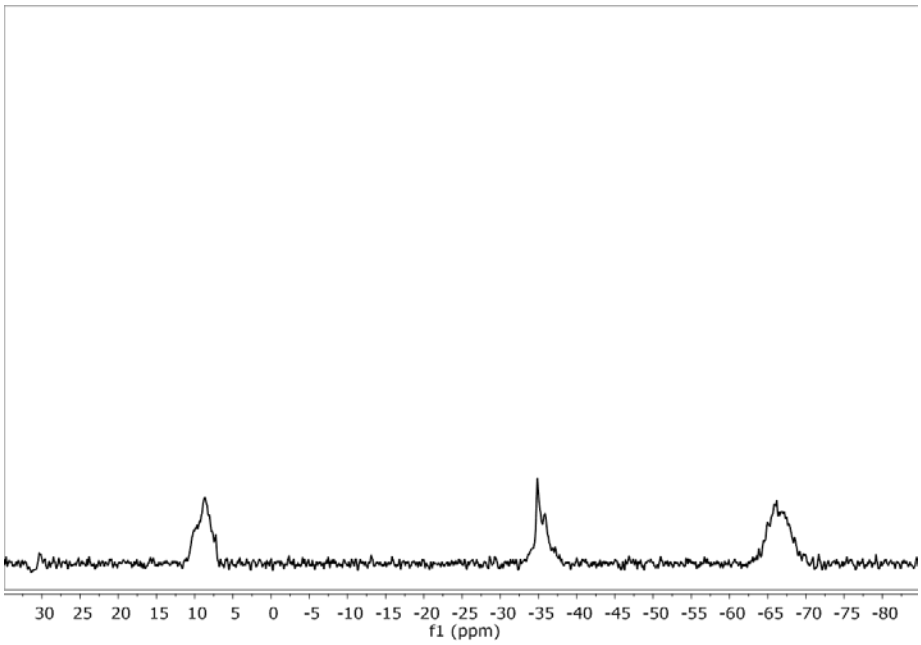

Figure S-3c. ^{29}Si NMR of Me-SiH-PMHS **VI**.

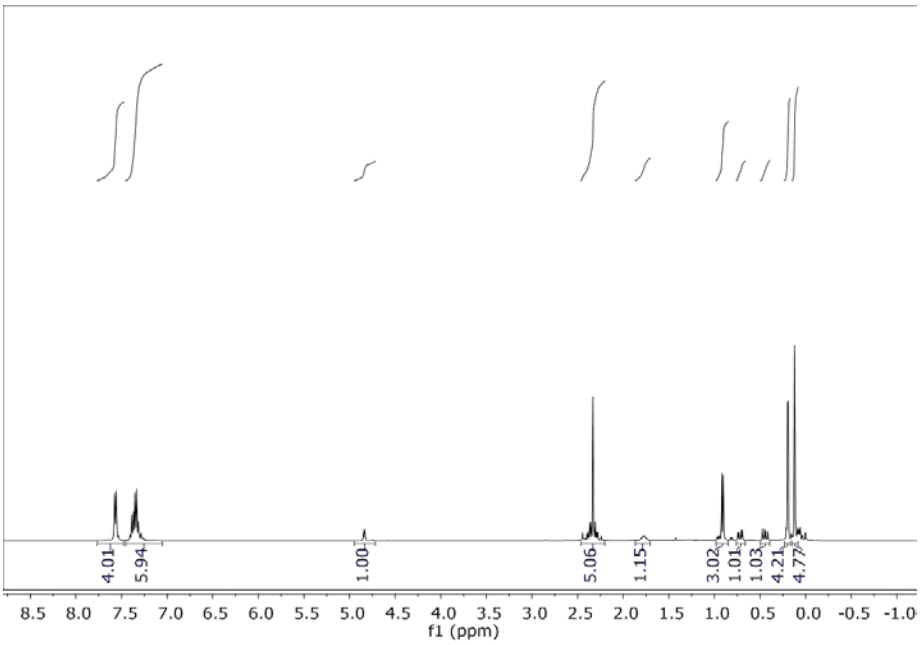

Figure S-4a. ^{1}H NMR of Compound **VIII**.

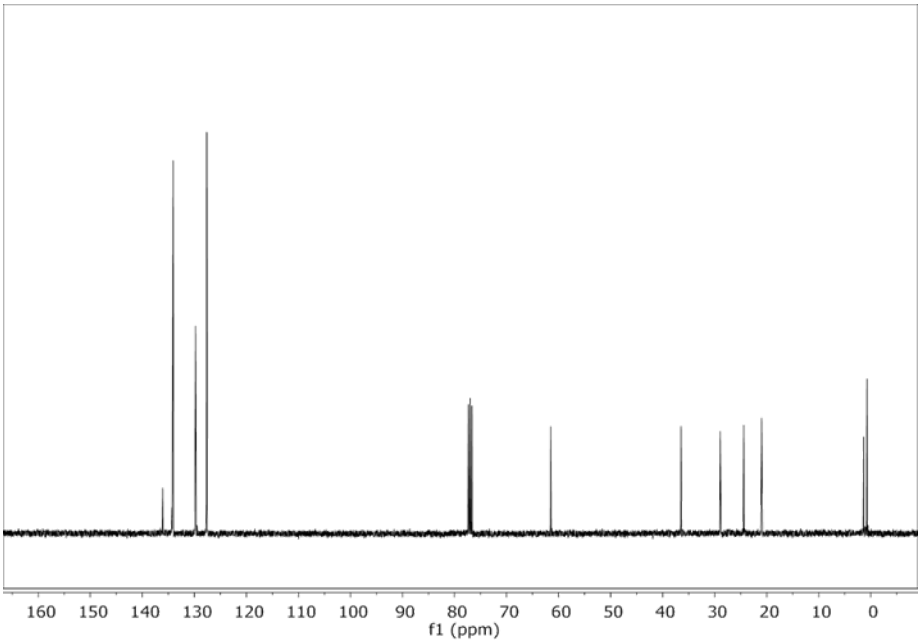

Figure S-4b. ^{13}C NMR of Compound **VIII**.

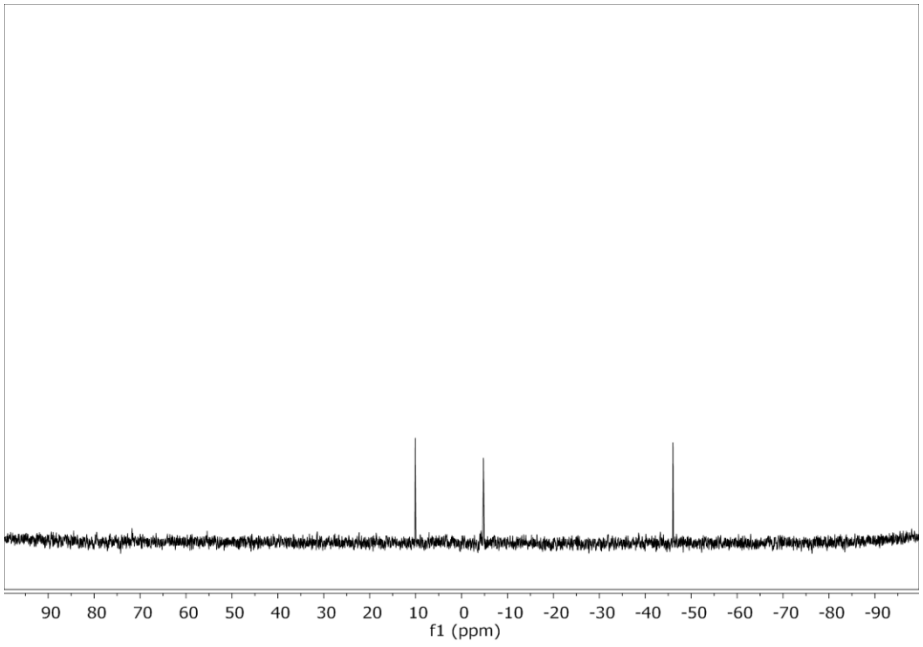

Figure S-4c. ^{29}Si NMR of Compound **VIII**.

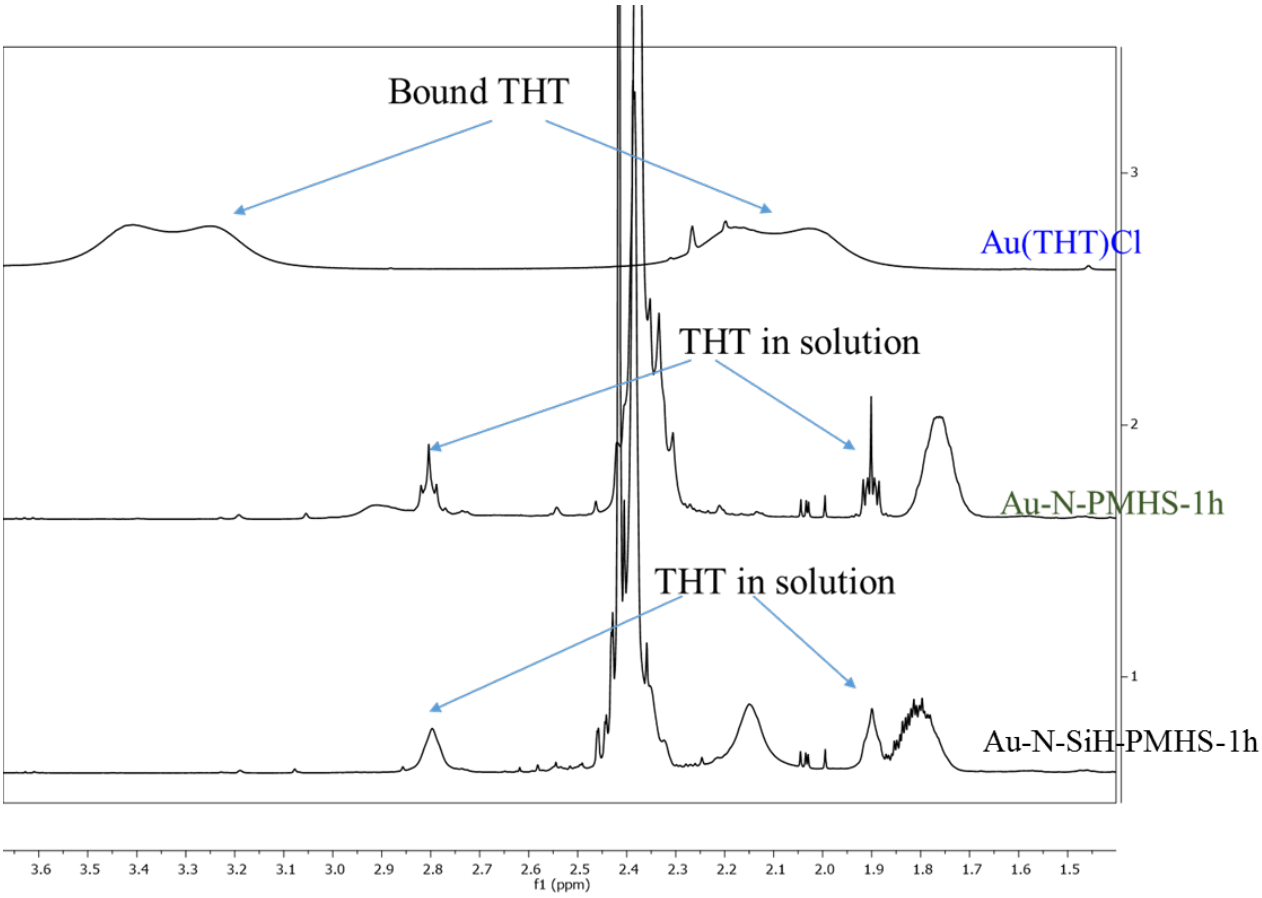

Figure S-5. ^{1}H NMR showing bound THT in Au(THT)Cl and unbound THT 1 h after addition of N-PMHS or N-SiH-PMHS.

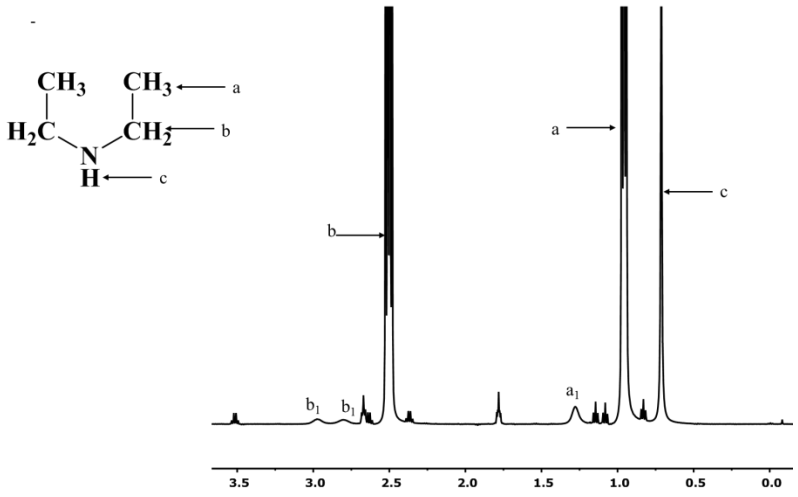

Fig. S-6. ^{1}H NMR of mixture containing diethylamine and Au(THT)Cl at a ratio of diethylamine to Au(THT)Cl of 10. Peaks a,b, and c denote resonances of different protons associated with diethylamine in solution. Peaks a1 and b1 are the corresponding protons of diethylamine coordinated to Au. Peak c1 at δ 6.85 ppm is not shown.

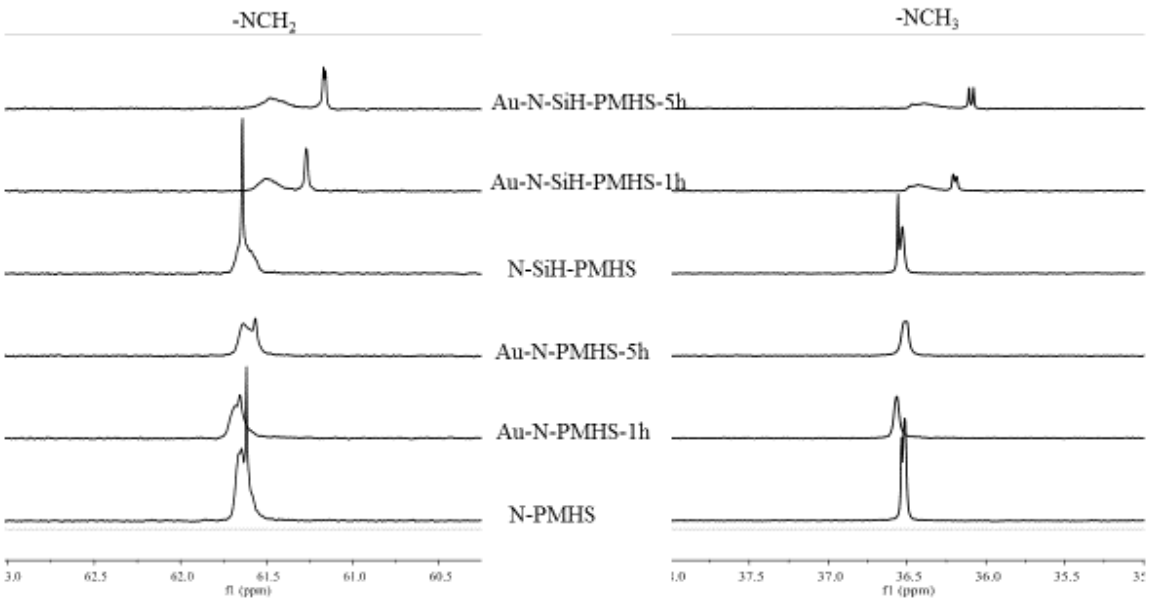

Figure S-7 ^{13}C NMR of CH_3 and CH_2 attached to the nitrogen of amine in various mixtures.

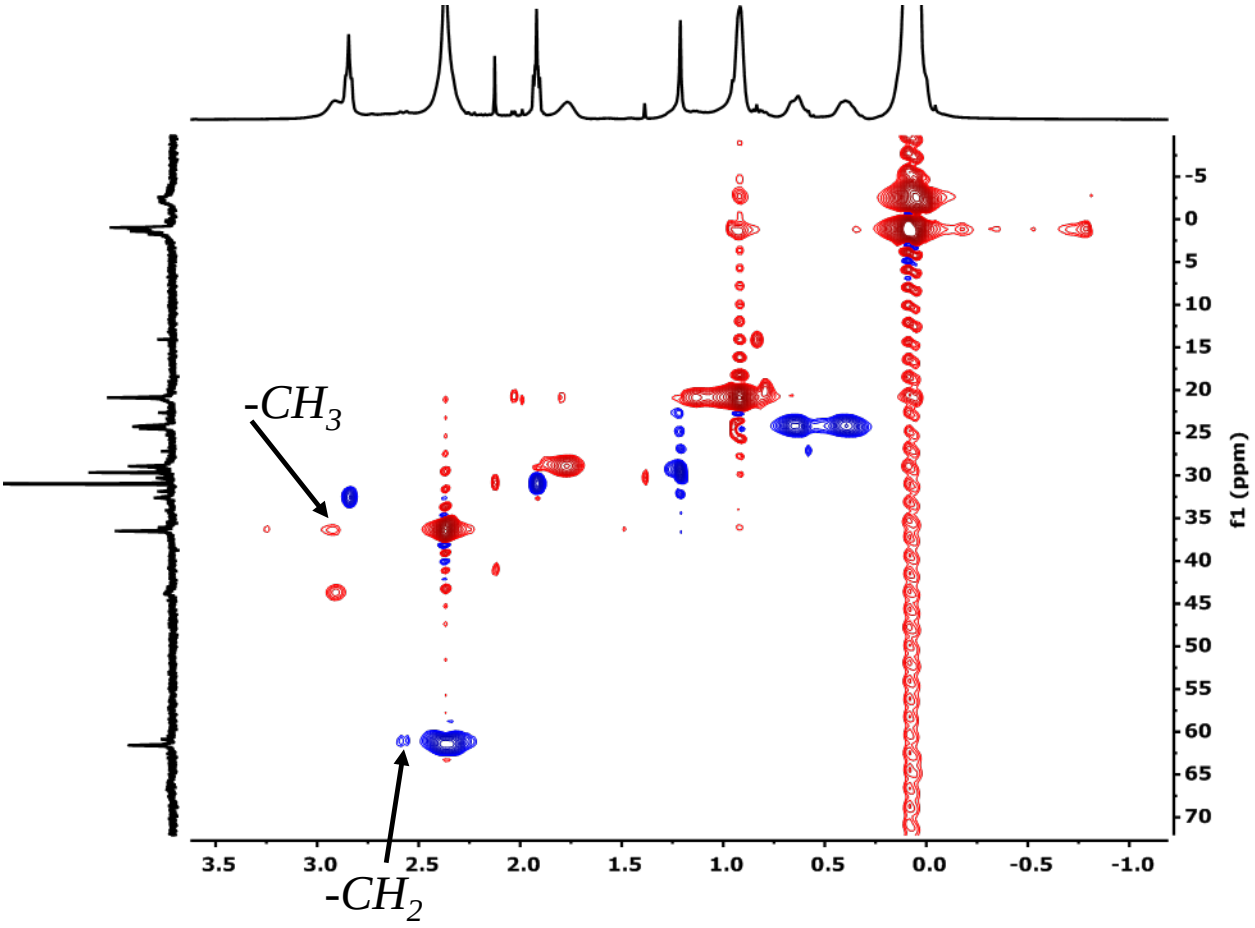

Figure S-8. HSQC of Au-N-PMHS-1h at amine to Au ratio of 10. The broad shoulder at δ 2.9 ppm is assigned to –CH_3 attached to N atom of amine coordinated to Au.

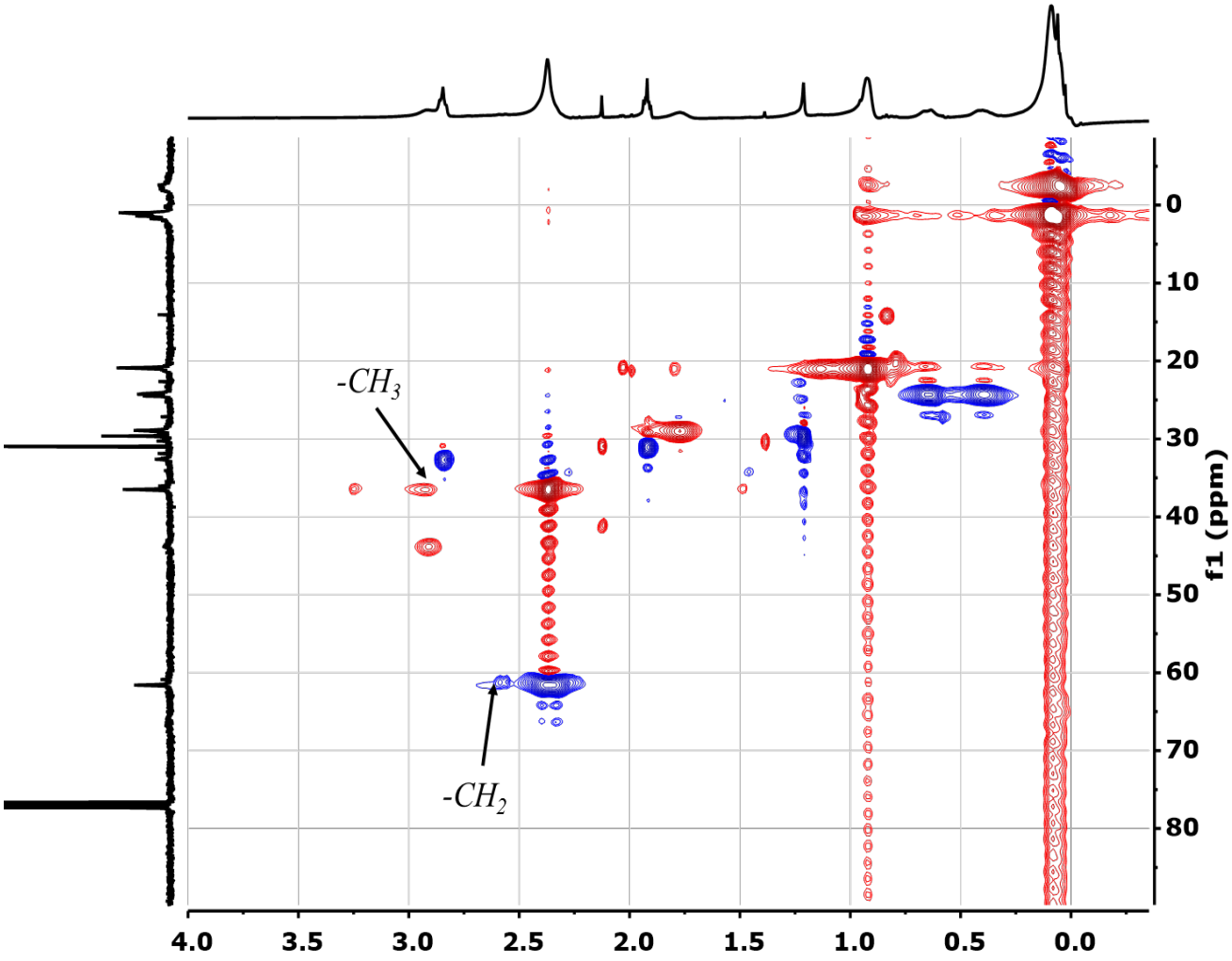

Figure S-9. HSQC of Au-N-PMHS-1h at amine to Au ratio of 2.5

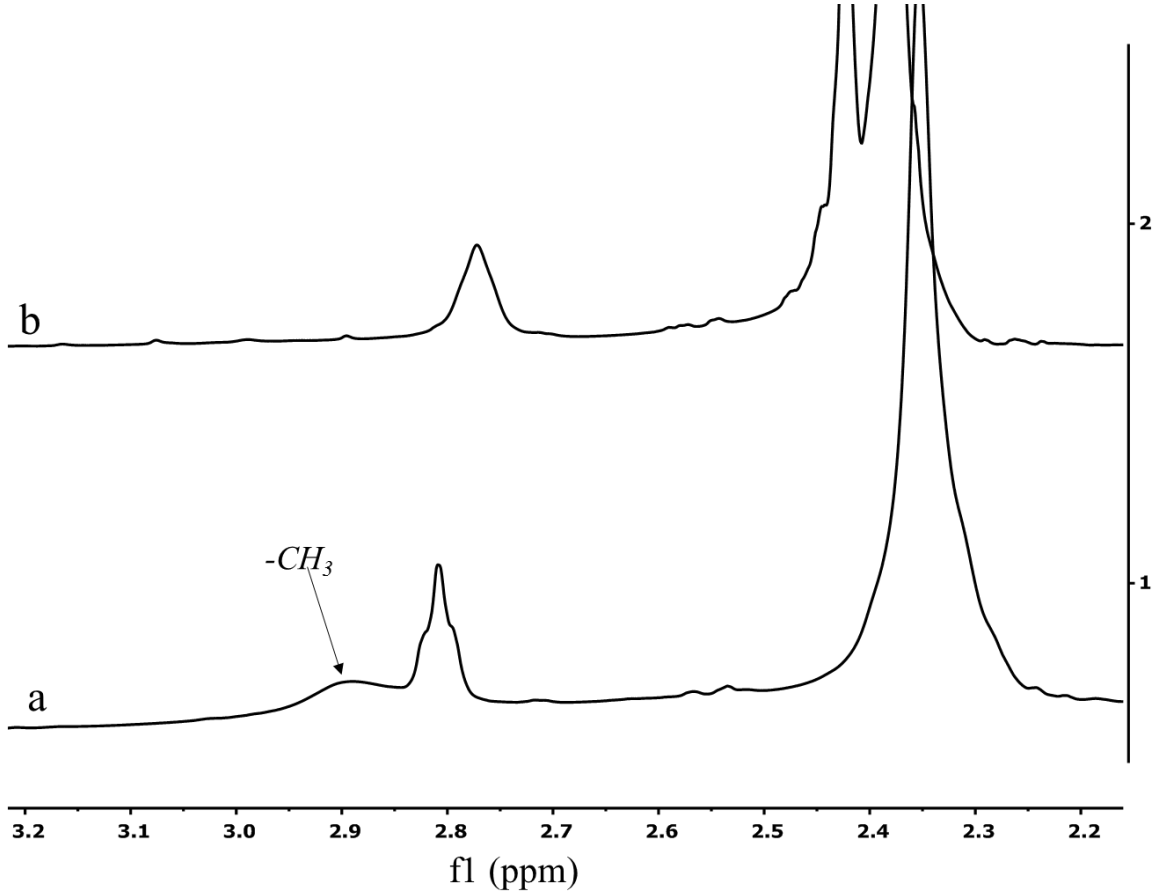

Figure S-10. ^{1}H spectrum (a) N-PMHS **IV** and Au(THT)Cl solution. Amine/Au=2.5 and (b) 10 minutes after addition of Et_3SiH to solution shown in curve a, Et_3SiH/Au=3. Spectrum showed that the peaks associated with –CH_3 attached to N atom of amine bound to Au(I) was no longer detectable.

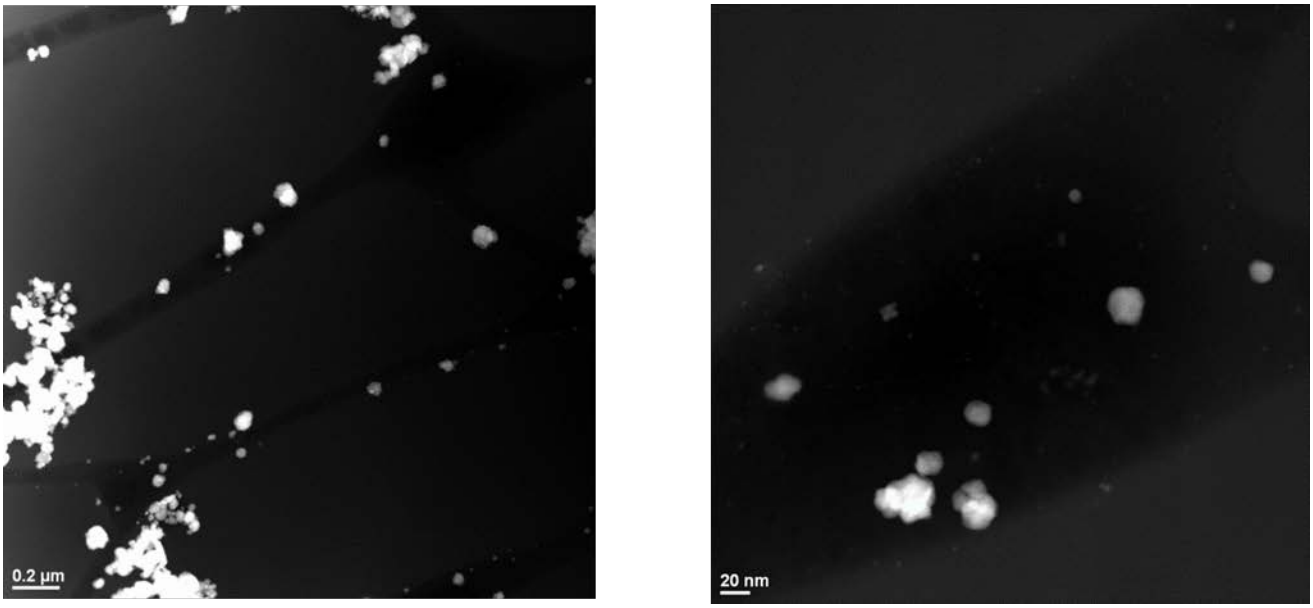

Fig. S-11 STEM images of Au-Me-SiH-PMHS

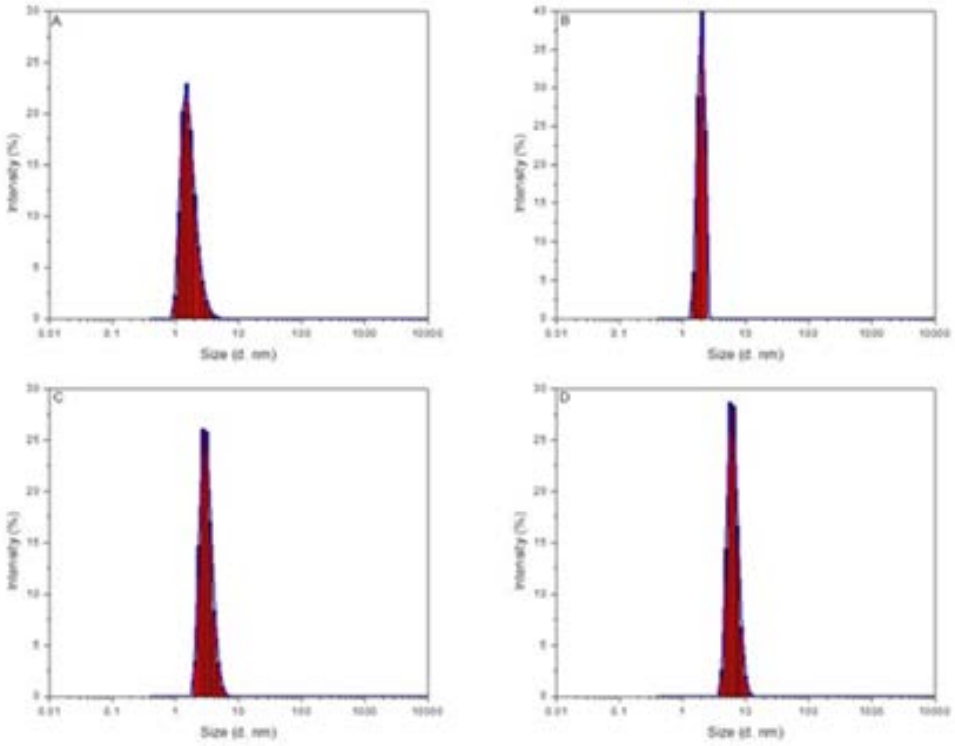

Fig. S-12 Size distribution of gold colloid determined by dynamic light scattering at room temperature for (mean particle size): A. (1.499 nm); B. (2.010 nm); C. (2.696 nm); and D. (5.615 nm). The samples A-D correspond to samples **a-d** listed in Table 1 of the main manuscript. Note that the x-axis is in log scale.

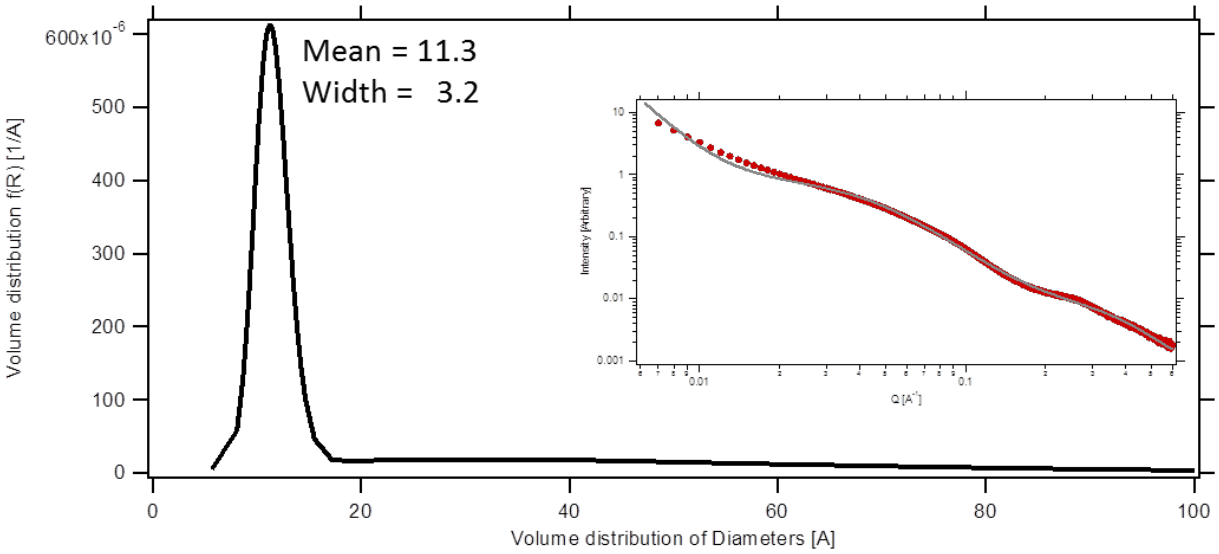

Fig. S-13 Size distribution of gold colloid determined by SAX of sample **a.** inset shows SAXS data and fitted results.

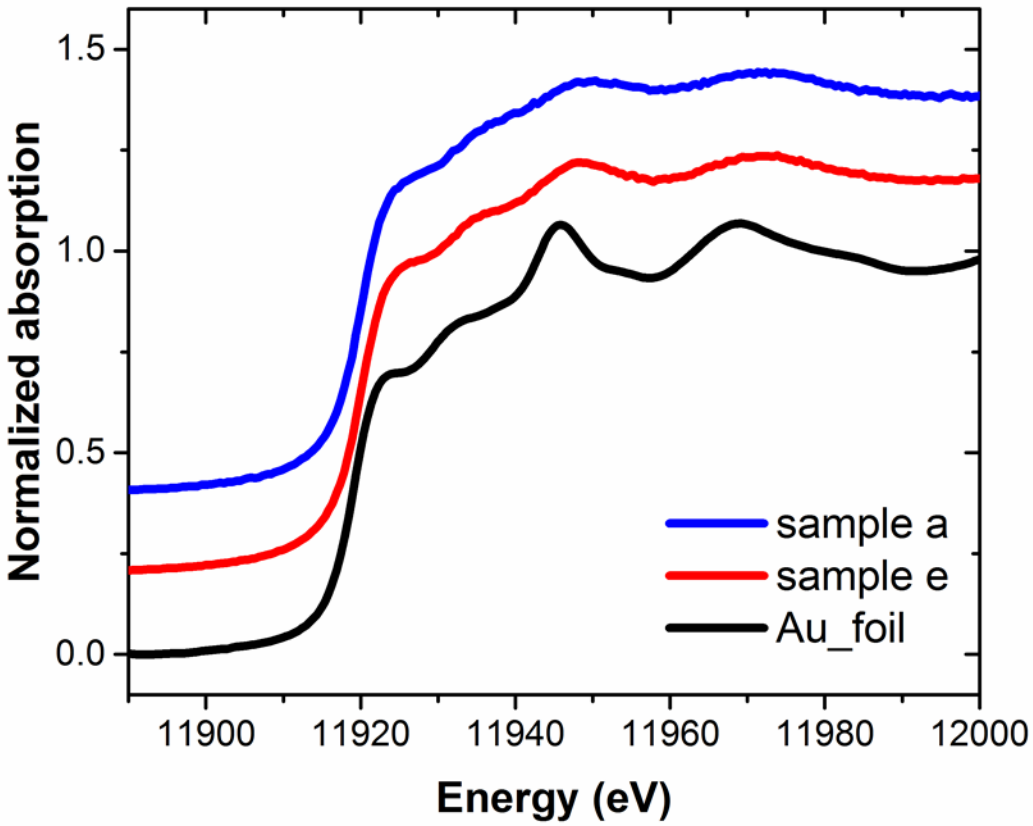

Fig. S-14 XANES spectrum of samplea **a**, **e** and gold foil.

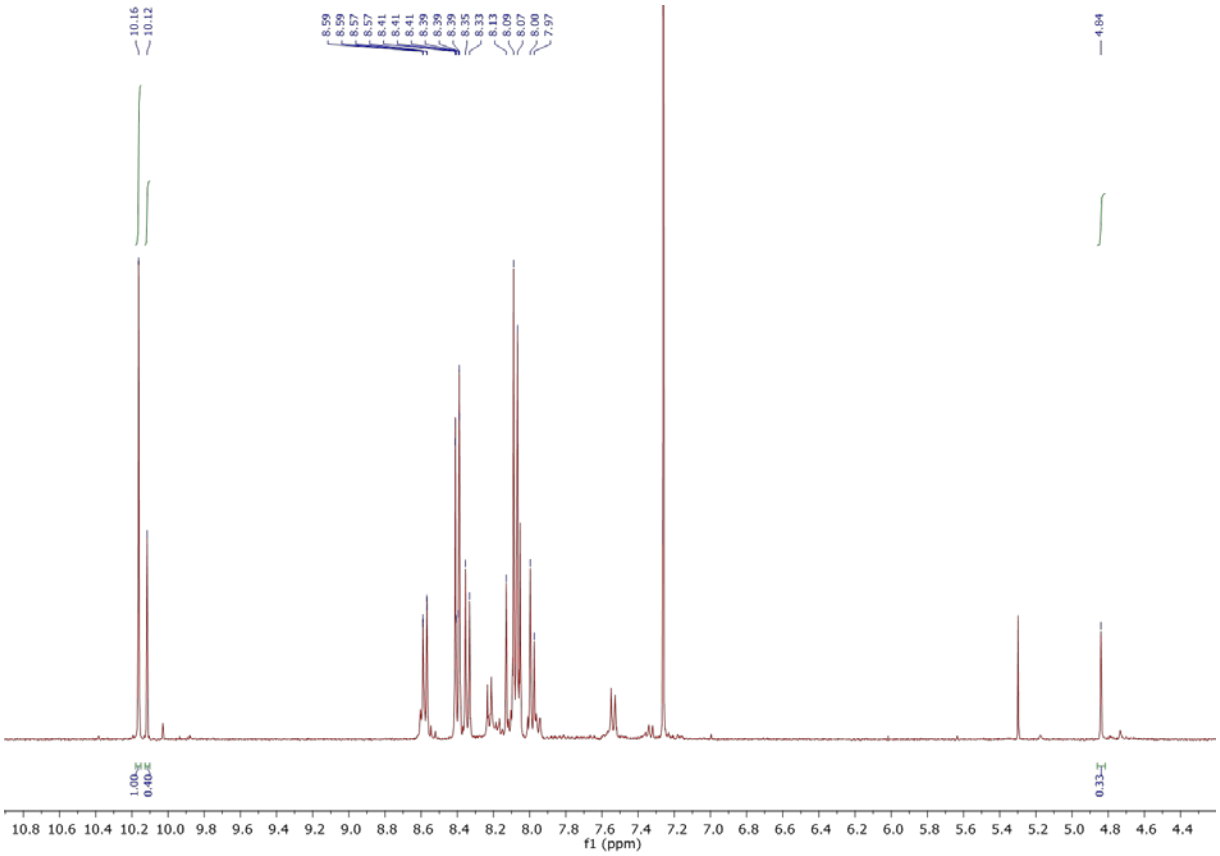

Fig. S-15 NMR spectrum of the products of catalytic conversion of p-nitrobenzaldehyde catalyzed by sample **a.** Calculations were done based on the CHO signal of the starting aldehyde at 10.16 ppm, imine product's CH=N at 10.12 ppm, and the alcohol's CH_2 at 4.84 ppm. Additionally analysis of the aromatic region showed no signs of other products. There is a CH2Cl2 peak at 5.3 ppm.