

# Electronic Supplementary Information

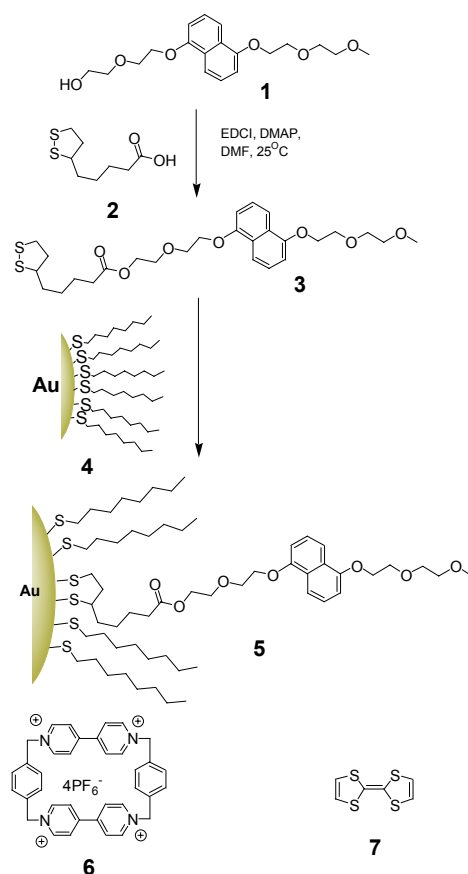
## The tuneable complexation of gold nanoparticles

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### Synthesis

#### Synthesis of 1.

This compound was prepared according to the literature method: P. R. Ahston, R. Ballardini, V. Balzani, S. E. Boyd and A. Credi, *Chem. Eur. J.* **1997**, *3*,152.

### Synthesis of 3

To a solution of **1** (0.62 g, 1.78 mmol) and thioctic acid (0.37g, 1.78mmol) in dry DCM (20 mL), were added EDCI (0.34 g, 1.78 mmol) and DMAP (0.01g, 0.08 mmol). The reaction was allowed to stir under nitrogen for 4 hours. The solvent was concentrated under reduced pressure and the residue was purified by column chromatography (petroleum ether 40-60/acetone 9:1) to afford **3** as a yellow oil (64%). <sup>1</sup>H NMR (CDCl<sub>3</sub>) δ = 1.44 (2H, m), 1.64 (4H, m), 1.88 (1H, m), 2.34 (2H, m), 2.43 (1H, m), 3.14 (2H, m), 3.42 (3H, s), 3.53 (1H m), 3.63 (2H m), 3.82 (4H m), 4.01 (4H m), 4.30 (6H m), 6.86 (2H *J* = 8.08 Hz, d), 7.37 (2H *J* = 8.56 Hz, t) 7.88 (2H *J* = 8.56 Hz, t). MS (FAB/NOBA): 538 [M+H]<sup>+</sup>. Found C, 60.33; H, 7.19; C<sub>27</sub>H<sub>38</sub>O<sub>7</sub>S<sub>2</sub> requires C, 60.20; H, 7.11.

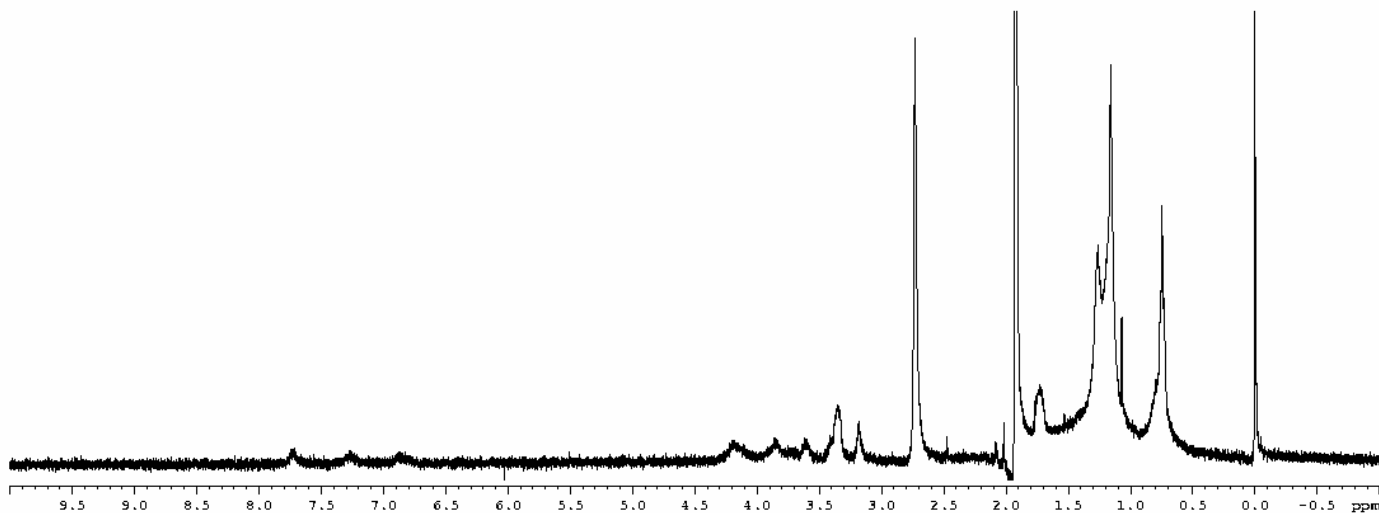
### Synthesis of 4

Octyl MPCs were prepared according the route described by: Boal, A. J.; Rotello, V. M. *J. Am. Chem. Soc.* **2002**, *124*, 5019.

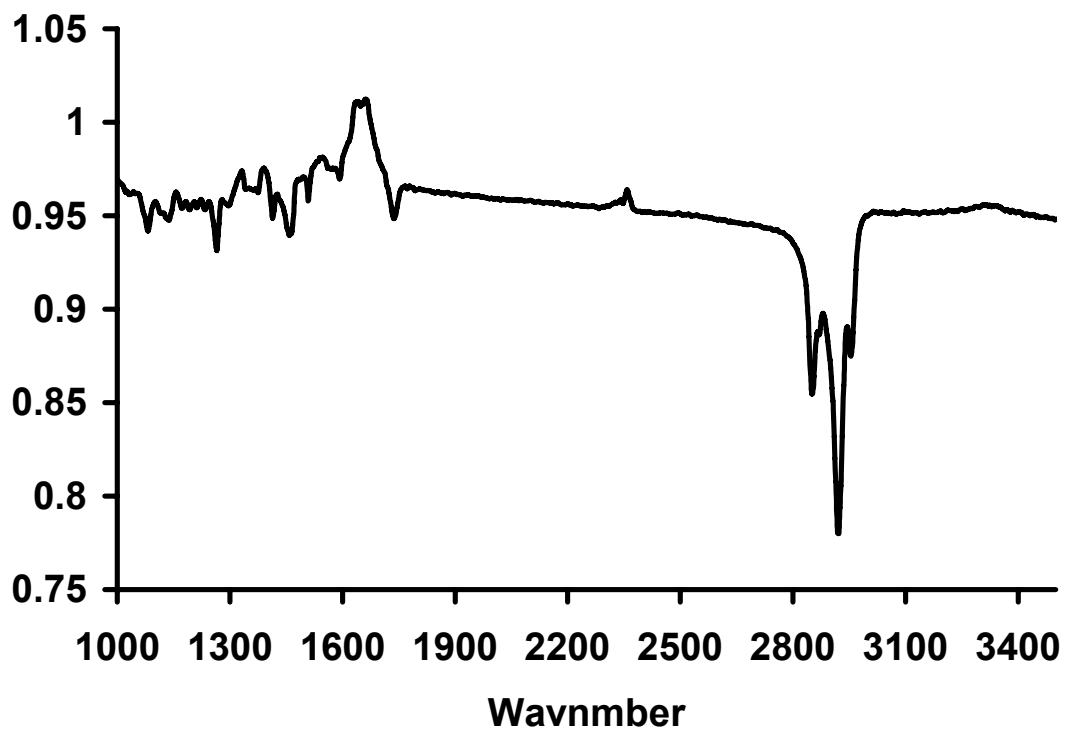
### Synthesis of 5

Toluene (30 mL) was added to dissolve the nanoparticles **4** (0.26g) and **3** (0.1023 g, mmol) was added. The solution was then stirred at room temperature for 20 hrs, under a blanket of N<sub>2</sub>. The solution was precipitated into acetonitrile (300 mL). After filtration, the nanoparticles were washed with acetonitrile (4 x 50 mL) and with diethyl ether (1 x 50 mL) and dried to yield 0.2 g of product.

<sup>1</sup>H NMR (acetone *d*-6) δ ppm: 7.70 (broad signal), 7.25 (broad signal), 6.85 (broad signal), 4.20 (broad signal), 3.85 (broad signal), 3.70 (broad signal), 3.60 (broad signal), 3.35 (broad signal) 3.15 (broad signal), 2.7 (broad signal), 2.10 (broad signal) 1.9-0.7 (broad signals).



NMR spectrum of **5** in  $\text{CD}_3\text{COCD}_3$



FTIR (Solid film on NaCl, cast from  $\text{CH}_2\text{Cl}_2$ ): 2939, 2919, 2848, 1733, 1454, 1263  $\text{cm}^{-1}$ .