Electronic Supplementary Information for:

Triethylsilane as a mild and efficient reducing agent for the preparation of alkanethiol-capped gold nanoparticle

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Experimental Section

General

^{1}H NMR (500 MHz) spectrum was measured in $CDCl_3$ at 25 ˚C on a Bruker Avance 500 spectrometer. Transition electron microscopic (TEM) observations were performed by using JEM-1200EX II and JEM-1230 BU with an acceleration voltage of 120 kV and 100 kV, respectively. TEM samples were prepared by dropping of the $CHCl_3$ solution of gold nanoparticle (AuNP) on 150 mesh carbon coated copper grids, which were purchased from Okensyoji. UV-vis spectrum was measured in $CHCl_3$ at 25 ˚C on a Hitachi U3310 spectrometer. Chloroauric acid tetrahydrate was purchased from Tanaka Kikinzoku Kogyo. Triethylsilane was purchased from Shin-Etsu Chemicals. Other chemicals were purchased and used as such.

General procedure for thiol-capped AuNP 1

To a screw-capped test tube equipped with a magnetic stirring bar were added $HAuCl_4$-$4H_2O$ (0.1 mmol, 41.2 mg), dodecanethiol (0.1 mmol, 23.9 μL) and THF (10 mL). Resulting mixture was vigorously stirred for 3 h at 25 ˚C to form a yellow solution. Triethylsilane (0.1 mmol, 15.9 μL) was then added dropwise at 25 ˚C to form immediately a purple solution. After stirring for further 6 h at 25 ˚C, ethanol was added to the solution to precipitate the AuNP, which was separated by centrifuge, washed with ethanol and dried under reduced pressure to afford 15.1 mg of **1**. ^{1}H NMR δ 0.88 (t, J = 6.6 Hz, CH_3), 1.26 (broad, CH_2). UV-vis ($CHCl_3$) λ_{max} = 528. The spectroscopic properties were identical with those of authentic sample (see reference 3 and 4).

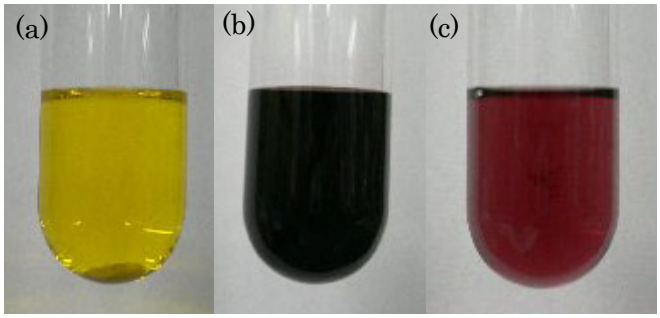

Fig. 1 Photographic image of the reaction mixture: (a) THF solution of $HAuCl_4$ and dodecanethiol (b) After addition of Et_3SiH. (c) THF solution of AuNP.

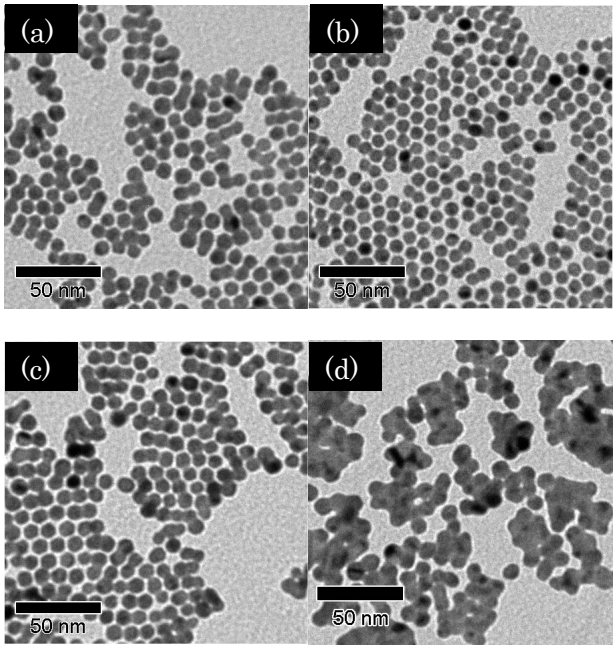

Fig. 2 TEM image of AuNP synthesized in (a) Bu_2O (9.3±0.91 nm) (b) cyclopentyl methyl ether (8.8±0.58 nm) (c) ^{t}BuOCH$_3$ (9.5±0.84 nm) (d) $CHCl_3$ (8.8±0.58 nm)

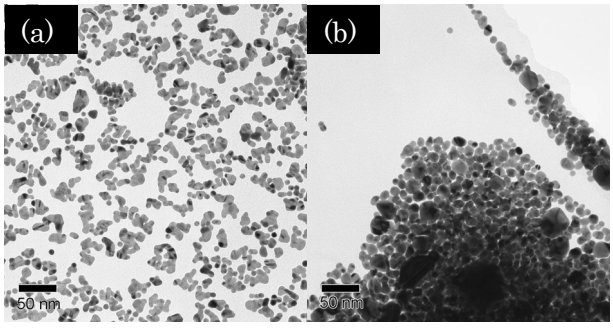

Fig. 3 TEM image of AuNP synthesized by treatment of (a) $Me_3SiOSiMe_2H$ (b) $HSiMe(OEt)_2$.