Supplementary Material (ESI) for Chemical Communications

Supporting information for:

Hybrid Porous Material Produced by Polymerization-Induced Phase Separation

Stanislav Dubinsky,[a] Alla Petukhova,[a] Ilya Gourevich[a] and Eugenia Kumacheva[a] *

Experimental

Materials

Monomers glycidyl methacrylate (GMA) and ethylene glycol dimethacrylate (EGDMA), a photoinitiator 2,2-dimethoxy-2-phenylacetophenone, and the porogen solvents dimethyl phthalate (DMP), di-*n*-hexyl phthalate (DHP), and diisodecyl phthalate (DDP) were purchased from Aldrich Canada and used as received. Thiol-terminated polystyrene was purchased from Polymer Source, Inc. (Doval, Quebec) and used as received. All reagents used in the synthesis of gold nanorods were purchased from Aldrich Canada and used as received.

Synthesis of gold NRs and ligand exchange

Gold nanorods (NRs) were synthesized following the procedure developed by Nikoobakht and El-Sayed.[1] Seed nanoparticles were prepared by reducing $HAuCl_4$ (0.12 mL, 5mM) mixed with 2.5 mL of an aqueous 0.2M solution of cetyl trimethylammonium bromide (CTAB) and sodium borohydride (0.5 mL, 10mM) in ice-cold water. For the preparation of a growth solution, 50 mL of a 0.2M CTAB solution were mixed with 5 mL of an aqueous 5mM solution of $HAuCl_4$, 2.8 mL of an aqueous 4mM $AgNO_3$ solution and 40 ml of water. Following the addition of 1 mL of an aqueous 0.8M solution of ascorbic acid, the dark yellow solution turned colourless. Finally, 0.8 mL of a 5-min-aged seed solution of nanoparticles were added to the growth solution. The NRs were purified using two 30-min-long centrifugation cycles at 8,500 r.p.m. (Eppendorf centrifuge 5417R). At the end of centrifugation cycle, the supernatant was removed and the

precipitated nanorods were redispersed in deionized water. The concentration of NRs of the aqueous solution was 0.007 wt %. (estimated by atom absorption spectroscopy). Approximately 0.5 mL of 0.007 wt.% aqueous solution of NRs was added to 10 mL of a 0.01wt% solution of thiol-terminated polystyrene (M_w= 21,500) in tetrahydrofurane. The solution was sonicated for 45 min and subsequently incubated for 24 h. The modified NRs were purified using one 20-min-long centrifugation cycles at 11,000 r.p.m. The supernatant was removed and the precipitated NRs were redispersed in tetrahydrofurane. The concentration of polystyrene-terminated NRs in THF was 0.08% wt. (estimated by atom absorption spectroscopy).

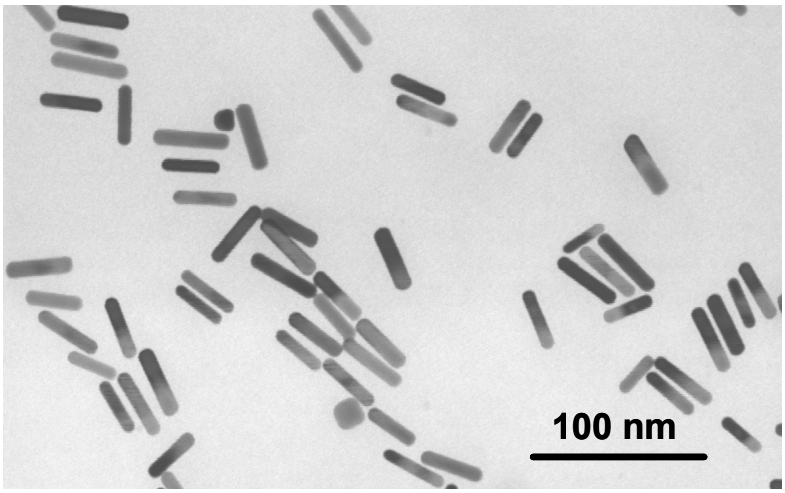

Figure S1. Transmission electron microscopy image of gold nanorods end-terminated with thiol-terminated polystyrene.

Notes and references

[a] *Department of Chemistry, University of Toronto, 80 St. George Street, Toronto, Ontario, M5S 3H6, Canada . Fax: +1-416-978-3576; Tel: +1-416-978-3576;*
E-mail: ekumache@chem.utoronto.ca

1 B. Nikoobakht and M. A. El-Sayed, *Chem. Mater*., 2003, **15**, 1957