

Electronic Supplementary Information

for

Fabrication of chiral silver nanoparticles and chiral nanoparticulated film via organogel

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by

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Synthesis of the gelators

Synthesis and characterization of N, N'-bis(octadecyl)-L-Boc-glutamic-diamide (LBG2C18) were reported previously by our group¹. The Boc group was made to free amino by mixing with trifluoroacetic acid in dichloromethane and separated. This compound was further reacted with maleic anhydride to give M-LG2C18. Then M-LG2C18 was transferred to the silver salt by reacting with Ag₂O. The characterization data for Ag-M-LG2C18 was as follows. ¹H-NMR (DMSO-d₆, 300Hz) δ (ppm): 0.84-0.86 (t, 6H, J = 6.0Hz, CH₃); 1.26 (br, 60, CH₂), 1.40-1.45 (m, 4H, CH₂); 1.79-1.96 (m, 2H, CH₂); 2.10-2.15 (m, 2H, CH₂); 2.99-3.07 (m, 4H, CH₂), 4.17-4.19 (m, 1H, CH); 5.68-5.72 (d, 1H, J = 12.0Hz, CH); 6.12-6.16 (d, 1H, J = 12.0Hz, CH); 7.34 (br, 1H, NH); 7.43 (br, 1H, NH); 10.71(br, 1H, NH). El. Anal. Calcd for C₄₅H₈₄AgN₃O₅·H₂O C: 61.91, H: 9.93, N: 4.81; found C: 61.97, H: 9.90, N: 4.87.

Gelation property of the gelators:

solvents	M-LG2C18	Ag-M-LG2C18
methanol	White Gel	White Gel
ethanol	White Gel	White Gel
DMSO	Transparent Gel	Transparent Gel
toluene	Transparent Gel	Transparent Gel

Preparation of silver nanoparticles

5 mg Ag-M-LG2C18 were dissolved in 1 mL ethanol under heating. After cooled to room temperature white gel formed. The formed gel was dispersed in 20 mL ethanol under vigorous stirring at room temperature and 6.5 mg hydroquinone was added to the mixture. Then the mixture was stirred for 3 hours in dark and yellow silver colloid was obtained.

Preparation of silver nanoparticles embedded thin films

2.5 mg Ag-M-LG2C18 and 5 mg PMMA ($M_w = 15,000$) was dissolved in toluene under heating and the hot solution was cast on quartz slide and transparent gel layer formed. After evaporation of toluene in vacuum, a uniform transparent film was obtained. Then the film was placed nearby 50 mL 40% H_2NNH_2 aqueous solution in a sealed box for 24 hours and yellow film was obtained for measurements.

Measurement

FESEM was performed using a Hitachi S-4300 system and TEM images were obtained on a JEM-1011 electron microscope operating at accelerating voltages of 15

kV and 100 kV, respectively.

FT-IR spectra were obtained by a JASCO FT/IR-660 plus spectrophotometer. CD and UV-vis spectra were obtained by a JASCO J-815 CD and a JASCO UV-550 spectrophotometer, respectively. The spectra of silver colloid were measured using 10 mm quartz cell. The spectra of silver nanoparticles embedded film were measured using quartz slide. In the CD measurement of film, the quartz slide was placed perpendicular to the light path and rotated within the film plane to avoid polarization-dependent reflections and eliminate the possible angle dependence of the CD signals. All AFM pictures were measured with a Digital Instrument Nanoscope III Multimode system (Santa, Barbara, CA) with a silicon cantilever using the tapping mode. All the AFM images are shown in the height mode without any image processing except flattening.

Reference:

1. Y. G. Li, T. Y. Wang and M. H. Liu, *Soft Matter*, 2007, **3**, 1312-1317.