Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C

Supplementary Information

Electroactive Poly(oligoaniline)/Gold Nanocomposite Thin Films Prepared by Simultaneous Solid-State Deprotection and Redox Reaction

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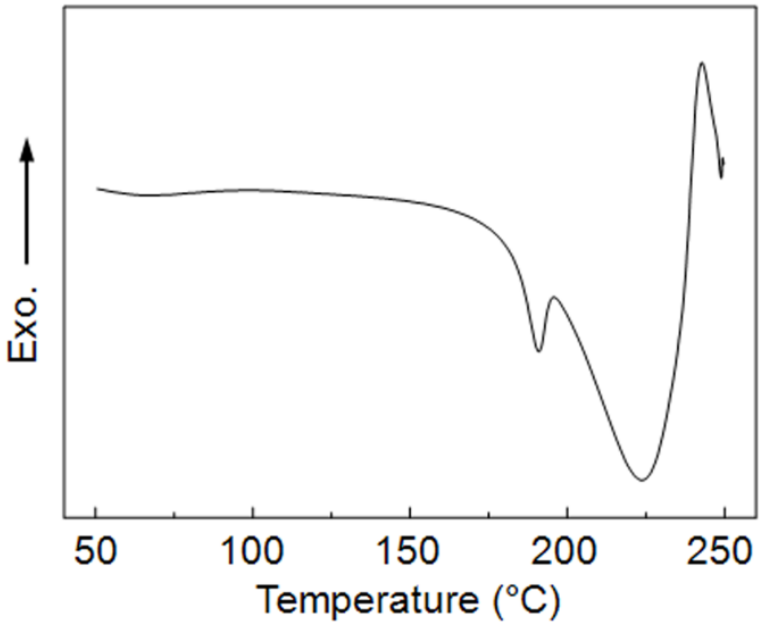

Fig. S1 DSC thermogram of *t*-BOC P7DD recorded at a heating rate of 10 °C/min under a nitrogen atmosphere.

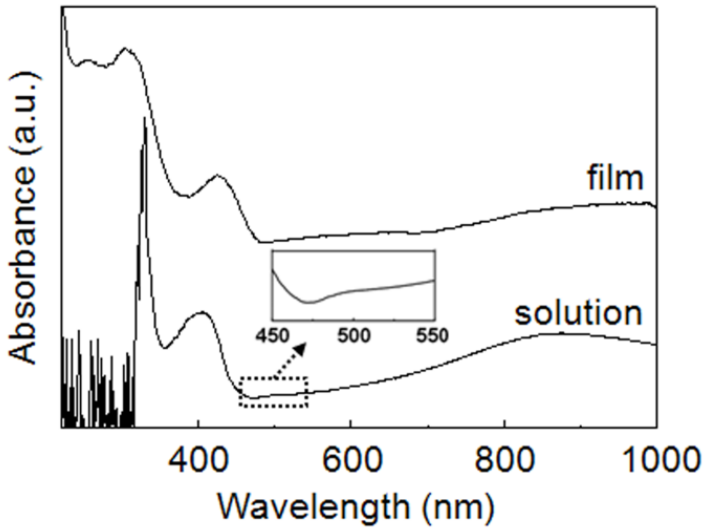

Fig. S2 UV-Vis spectra of the nanocomposite in *m*-cresol solution and its film. UV-Vis spectrum of solution was recorded after stirring the solution of *t*-BOC P7DD and $HAuCl_4$ for 30 min. The film was obtained by spin-coating the *m*-cresol solution onto the quartz plate, followed by drying completely *in vacuo*. Bare quartz plate was used as a background.

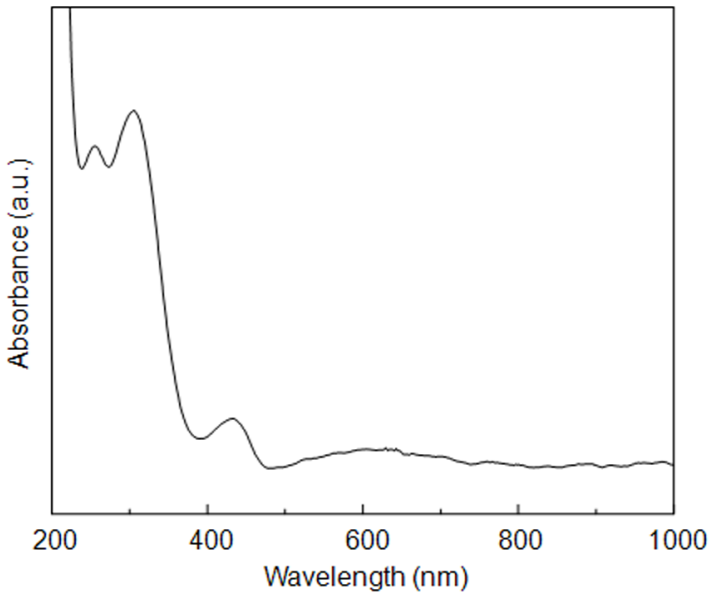

Fig. S3 UV-Vis spectrum of P7DD/Au film. A mixture solution consisting of *t*-BOC P7DD and $HAuCl_4$ in NMP was stirred at 65 °C for 24 h under a nitrogen atmosphere. Film was prepared by casting the resultant solution onto a quartz plate, followed by drying completely *in vacuo*.

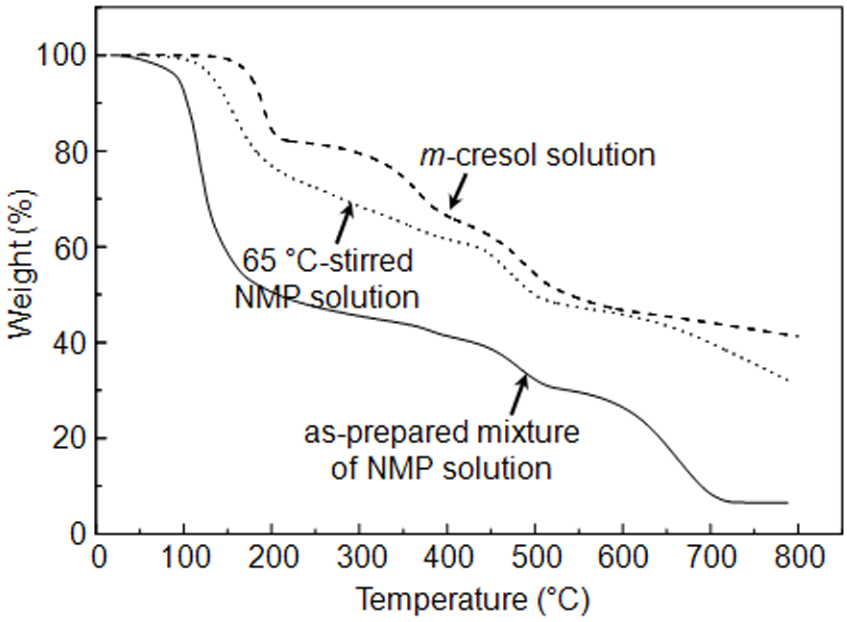

Fig. S4 TGA thermograms for the composite films prepared from a 65 °C-stirred NMP solution and a *m*-cresol solution obtained at a heating rate of 10 °C/min.

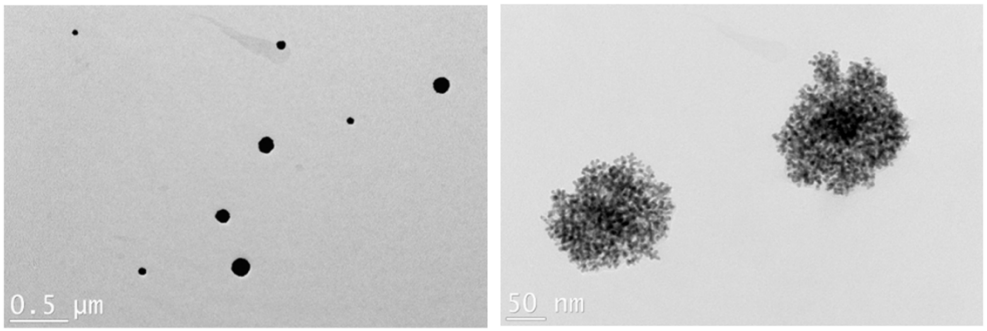

Fig. S5 TEM images of the nanocomposites obtained by heating the mixture film at 190 °C for 1 h under a nitrogen atmosphere, however, the mixture solution was not treated by sonication prior to film casting onto the carbon grid.

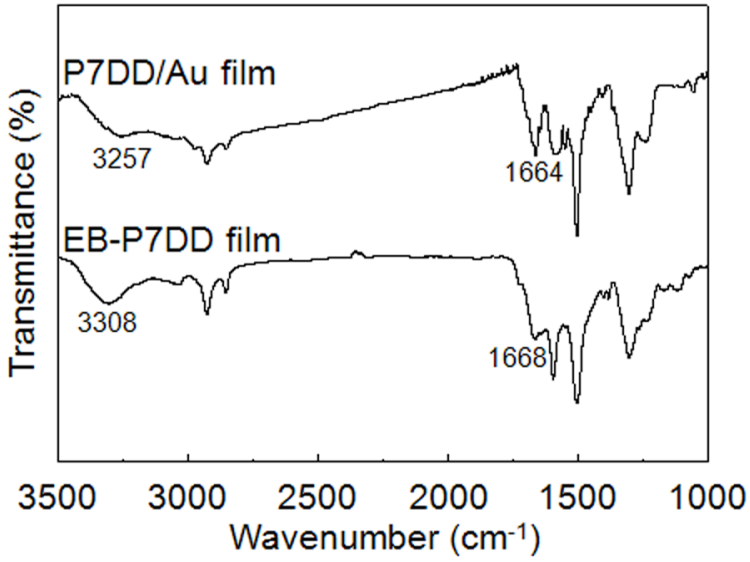

Fig. S6 FT-IR spectra of EB-P7DD and P7DD/Au films exhibiting hydrogen-bonding of urea groups.

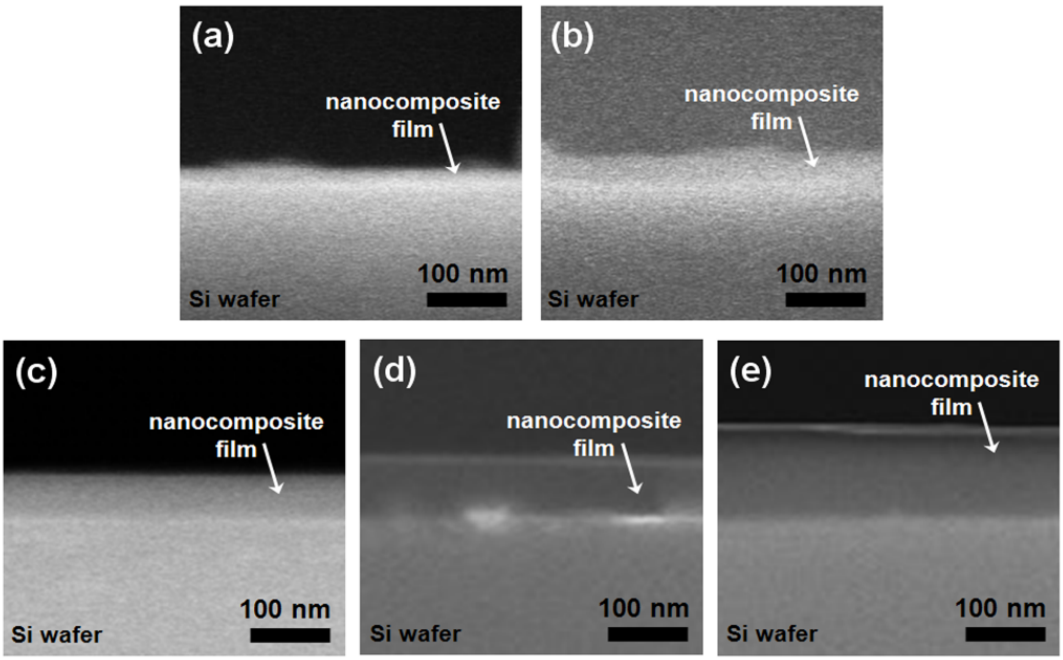

Fig. S7 Cross-sectional SEM images of nanocomposite films varying with different concentrations of mixture solutions prior to film casting onto Si wafers: (a) 3.5%, (b) 5.0%, (c) 7.0%, (d) 7.5%, and (e) 8.0%.