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

Supporting Information

Optical diffusers with enhanced properties based on novel fillers of polysiloxane@CeO_2@PMMA

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1、Preparation of polysiloxane@CeO_2@PMMA

The preparation of polysiloxane@CeO_2@PMMA core-hell microspheres using convenient method is as follows: 5 g MMA and 0.2 g KPS were dispersed in 200 mL deionized water，and the reaction was stirred for 4h at 75 °C (PMMA microspheres prepared). 7.6g $Ce(NO_3)_3 \cdot 6H_2O$ and 12.2 g hexamethylenetetramine was dissolved in 50 mL deionized water, which was added to the above solution with stirring for 4 h at 75 °C again (CeO2@PMMA prepared). Then, 20 mL or 10 mL VTMS in 50 mL ethanol was dripped slowly within half an hour and the mixture was reacted for 8 h at 60 °C. Finally, the mixture was filtered and washed thoroughly with distilled water. It was dried in vacuum at 60 °C for 12 h to obtain polysiloxane@CeO_2@PMMA.

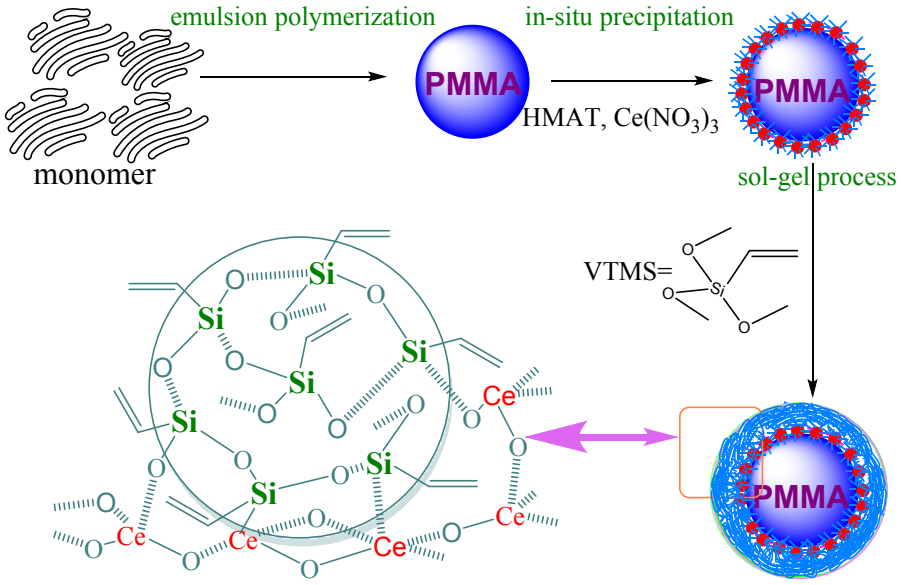


Figure S1. The synthesis route of polysiloxane@CeO_2@PMMA.

2、Structure of polysiloxane@CeO_2@PMMA

FT-IR Analysis

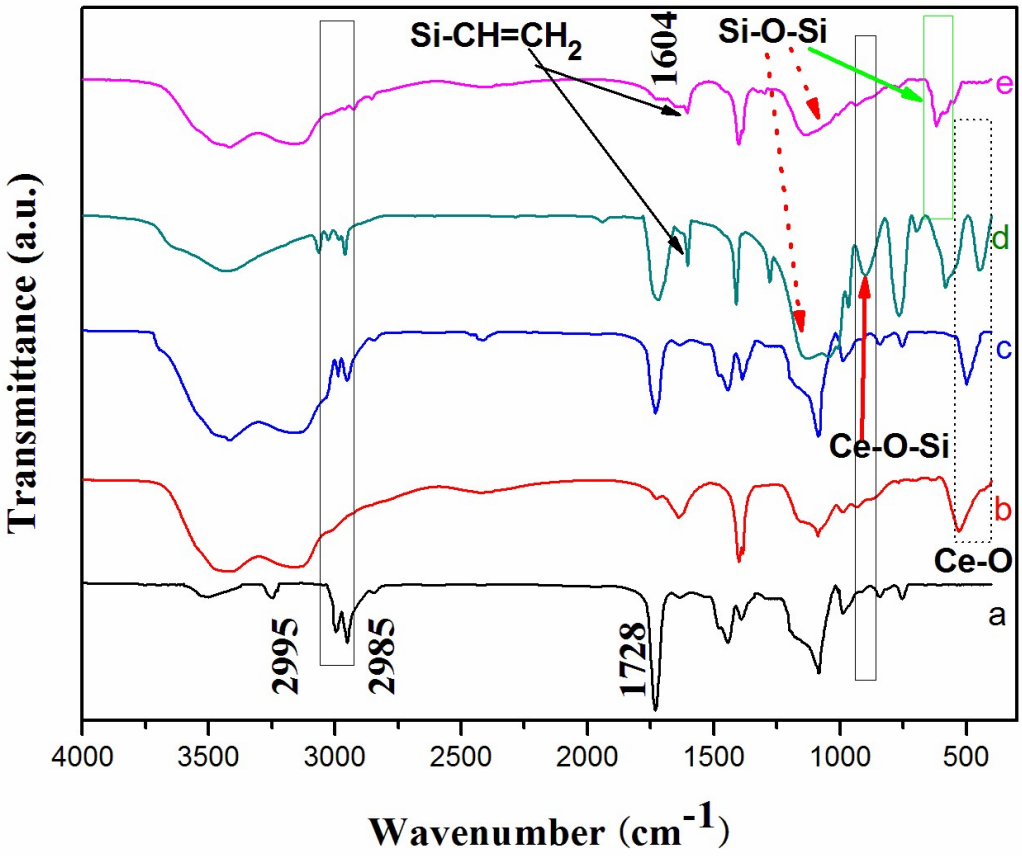


Figure S2. FT-IR spectra of (a) PMMA; (b) nano-CeO_2; (c) CeO_2@PMMA; (d) polysiloxane@CeO_2@PMMA; (e) poly(VTMS).

XRD Analysis

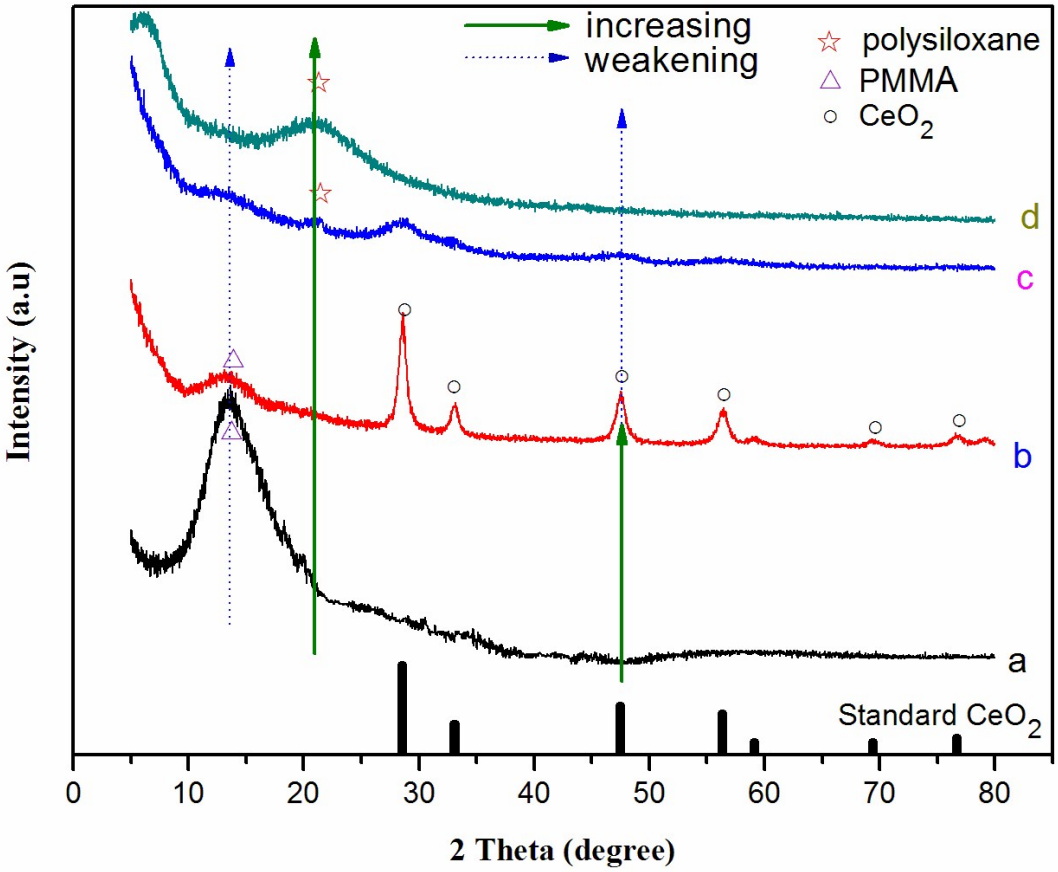
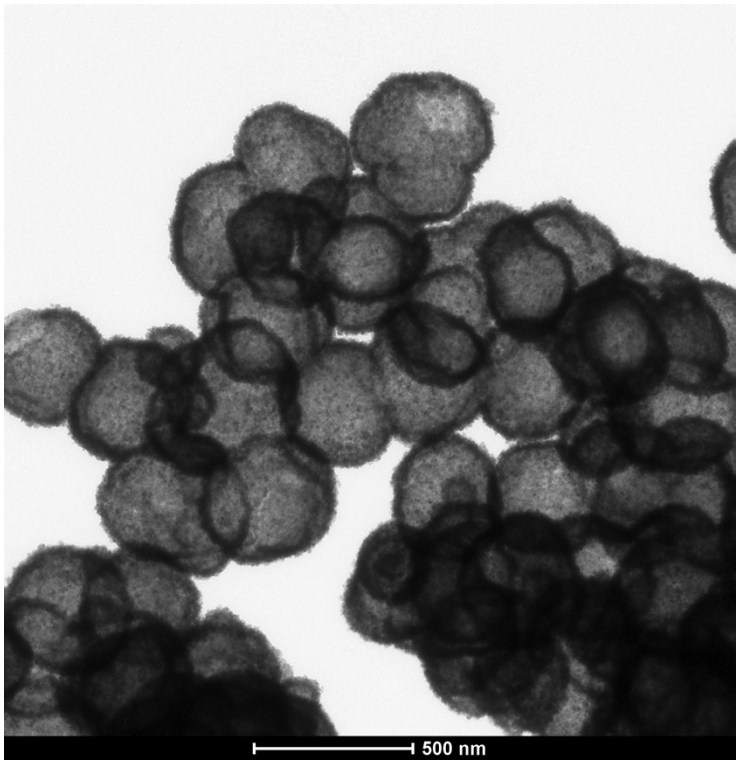
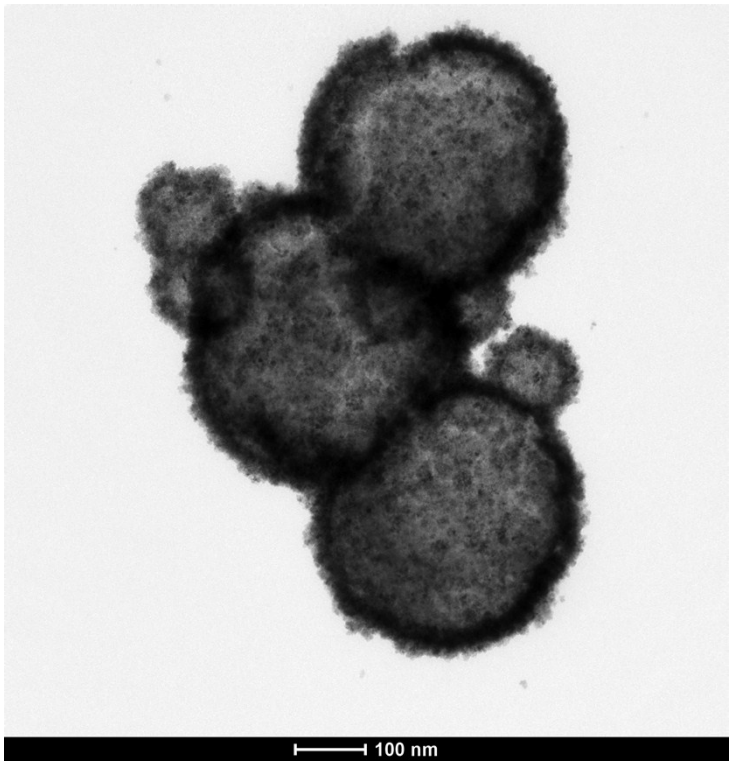


Figure S3. X-ray diffraction (XRD) patterns of (a) nano-CeO_2, (b) CeO_2@PMMA, (c) polysiloxane@CeO_2@PMMA, (d) poly(VTMS).

Morphology Analysis





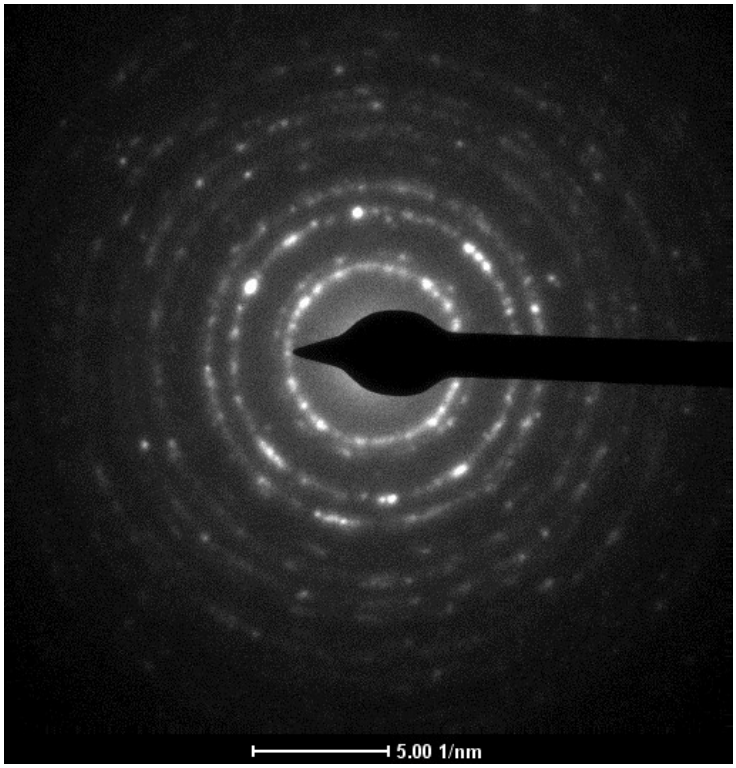
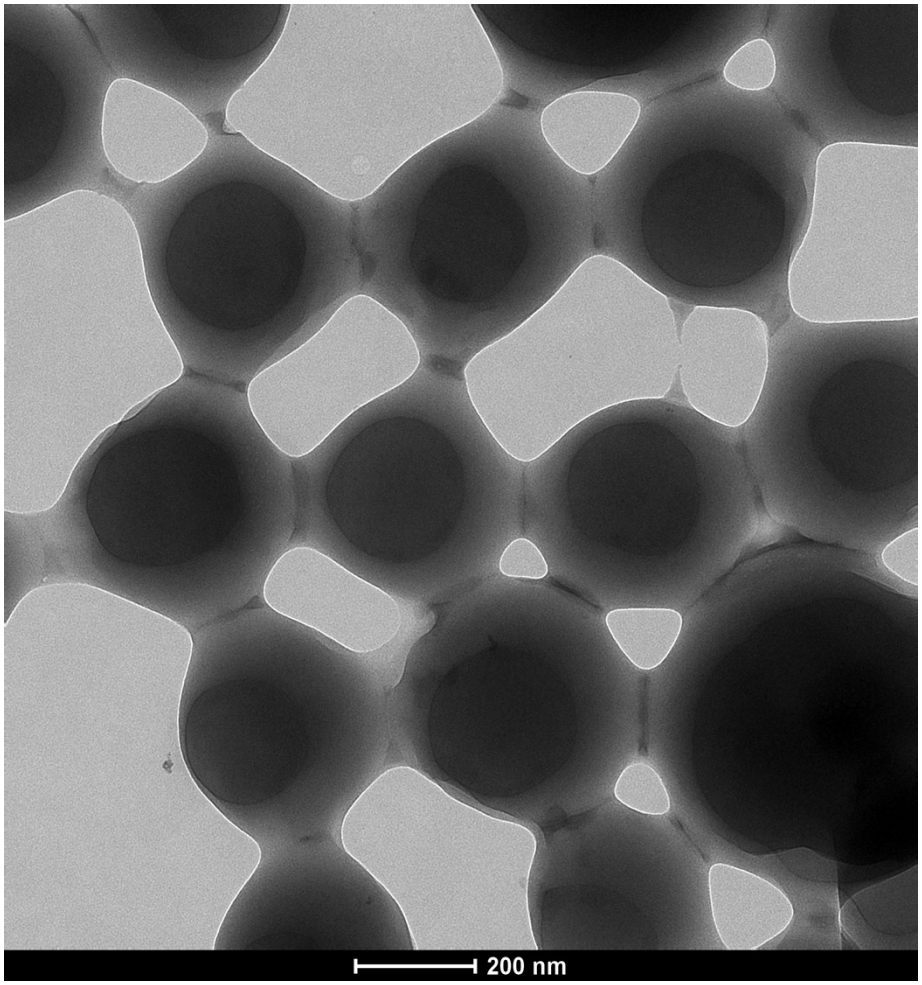


Figure S4. TEM image of CeO_2@PMMA.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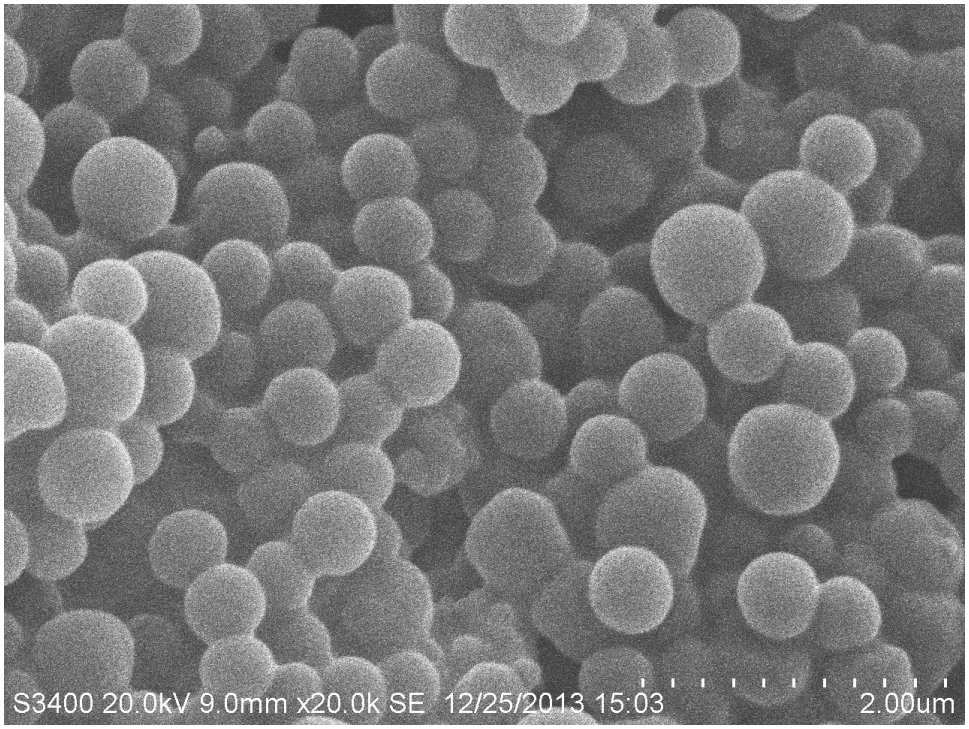
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2.00um

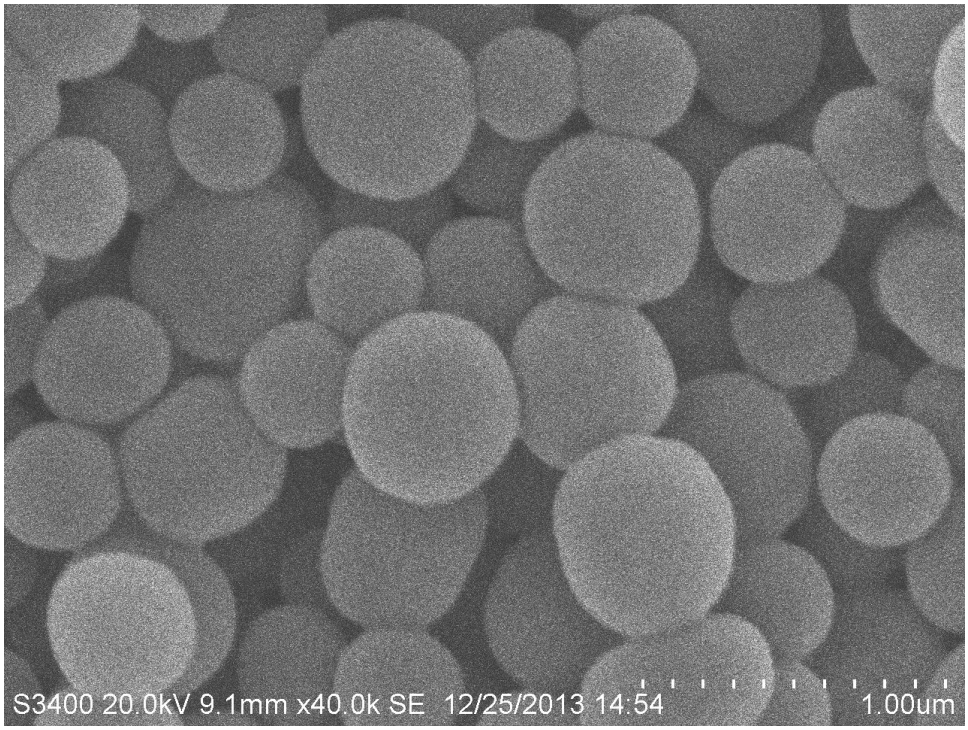

Figure S5. TEM image of polysiloxane@CeO_2@PMMA and SEM image of polysiloxane@CeO_2@PMMA.