Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Secondary Polarization in Electrorheological Phenomenon

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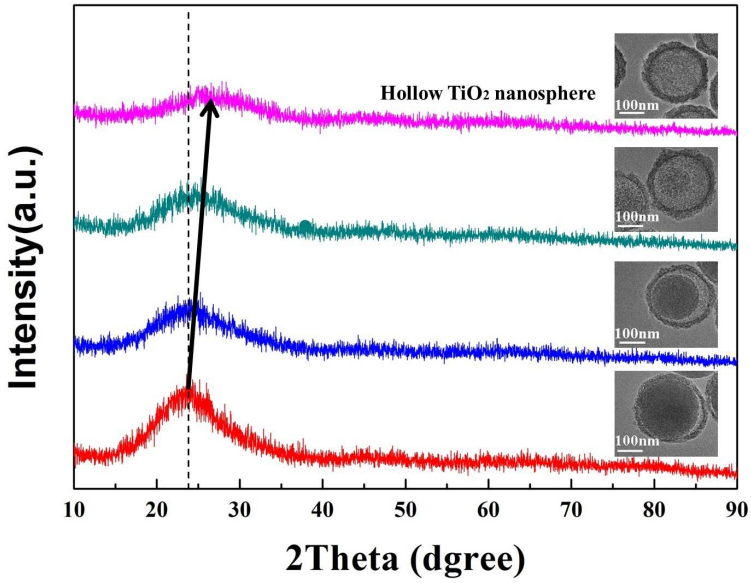

Figure S1. XRD of hollow TiO_2 nanospheres with different size of SiO_2 core.

Figure S1 shows the XRD of synthesized hollow TiO_2 nanospheres with different size of SiO_2 core. No characteristic peak is detected, indicating that both the SiO_2 and TiO_2 are amorphous. The broad peak around 23° gradually shifts to 26° (the broad peak of amorphous TiO_2), which is attributed to the decrease of silica content in SiO_2/TiO_2 composites. With the increasing content of TiO_2, the broad peak of amorphous TiO_2 at 26° becomes more prominent.

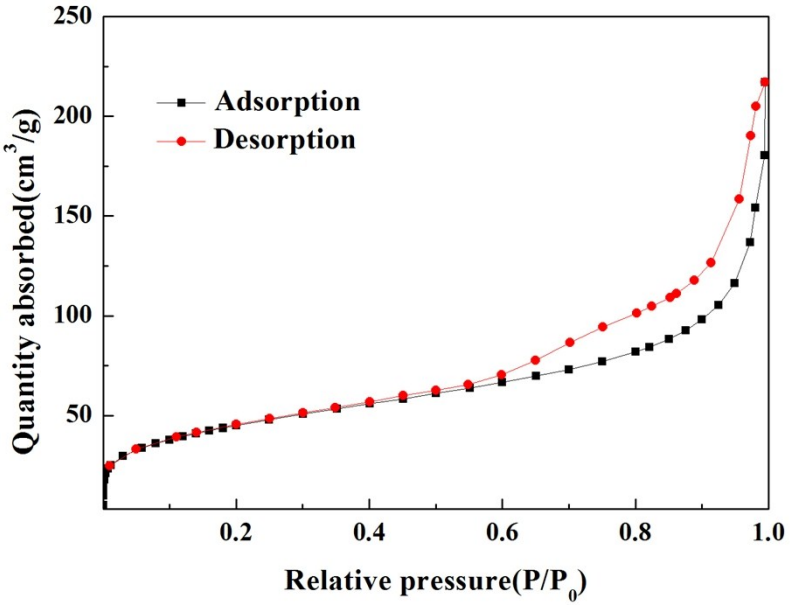

Figure S2. Nitrogen adsorption and desorption isotherms of the hollow TiO_2 nanospheres.

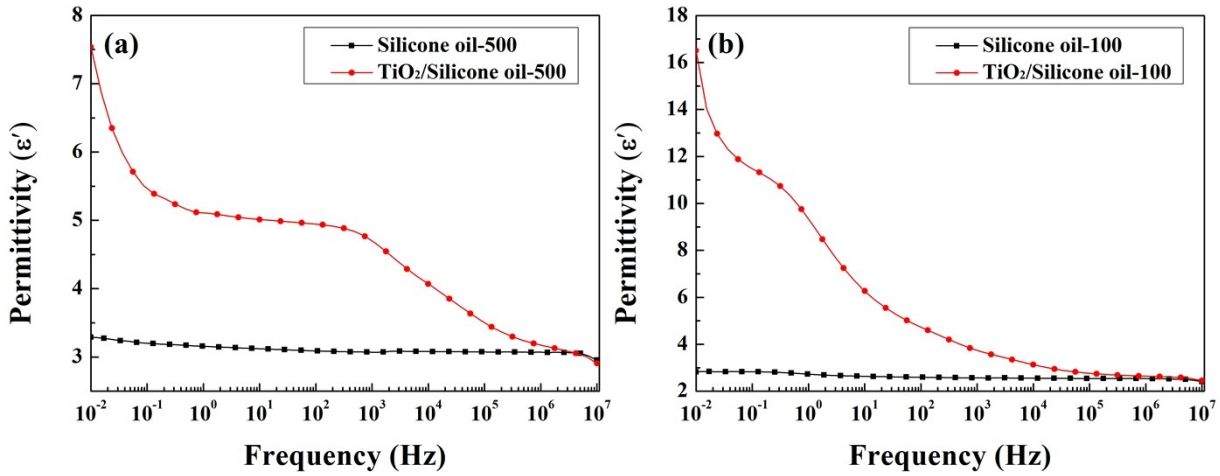

Figure S3. Permittivity (ε′) as a function of frequency for (a) ER fluid–500 and pure silicone–500; (b) ER fluid–100 and pure silicone–100.

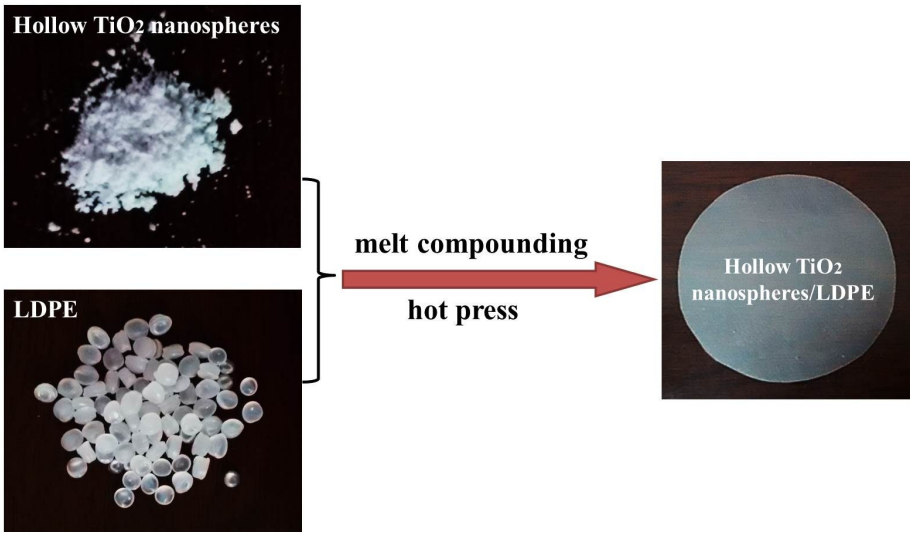

Figure S4. The photographs of hollow TiO_2 nanospheres, LDPE and hollow TiO_2 nanospheres/LDPE composite and the schematic of the formation of hollow TiO_2 nanospheres/LDPE composite.

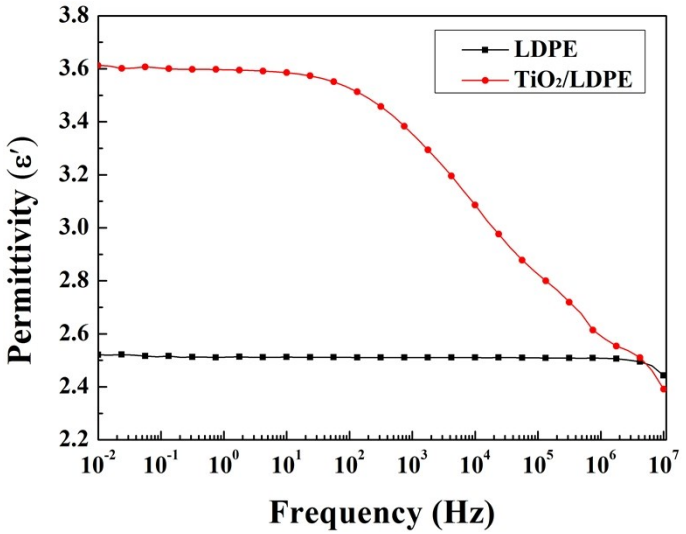

Figure S5. Permittivity (ε′) as a function of frequency for pure LDPE and TiO_2/LDPE.