Supplementary Material (SEI)

Surface Functionalized Barium Sulfate Nanoparticles: Controlled *in situ* Synthesis and Application in Bone Cement

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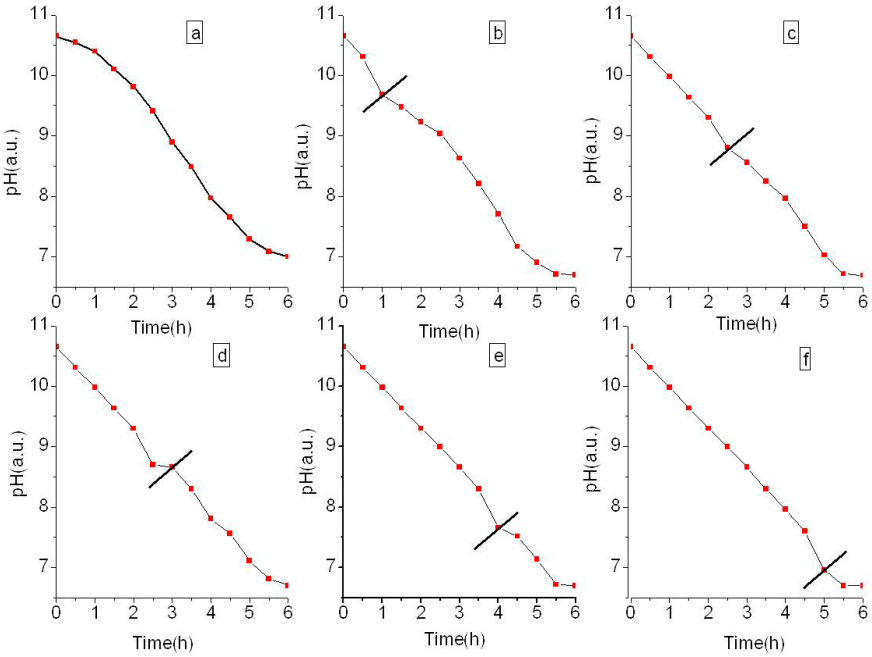

Figure S1. pH evolution along with reaction time with different pre-decomposition time (reaction temperature before mixing: 90 °C, reaction temperature after mixing: 60 °C) and fixed MSAH/$BaCl_2$ molar ratio of 0.016.a: 0 h; b:1 h; c:2 h; d:3 h; e:4 h; f:5 h. The black lines indicate the end of the pre-decomposition stage and start of the formation of $BaSO_4$ by mixing two stock solutions together.

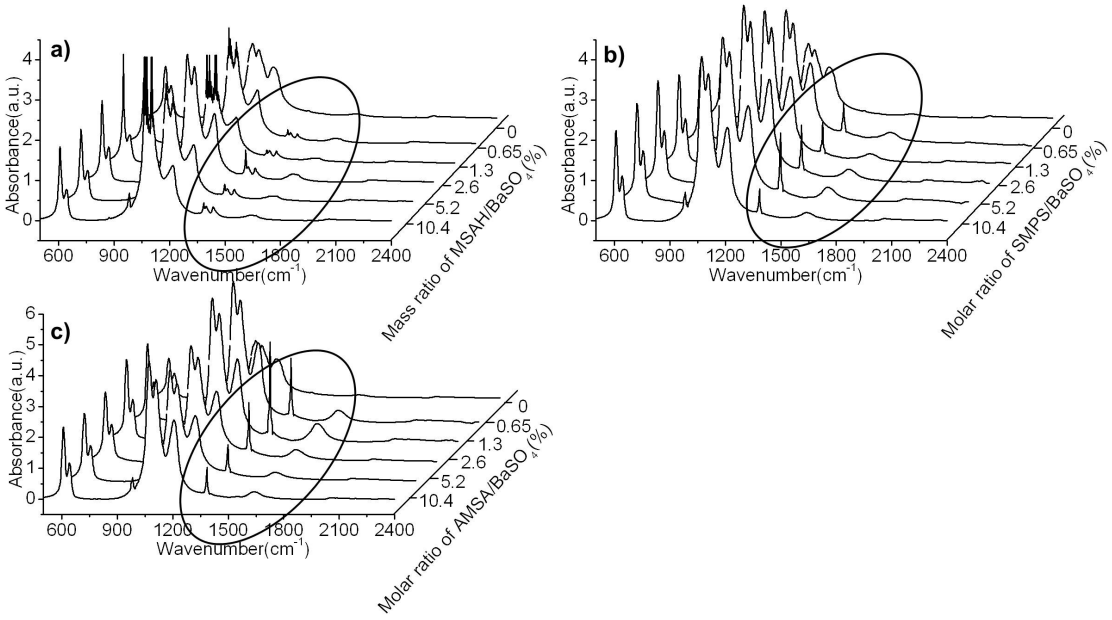

Figure S2. FTIR spectra of the $BaSO_4$ nanoparticles synthesized with different molar ratios of surface modification agent over $BaCl_2$ and the pre-decomposition time of 60 min (a: 0-0.104 mass ratio of MSAH/$BaCl_2$, b: 0-0.104 mass ratio of SMPS/$BaCl_2$, c: 0-0.104 mass ratio of AMSA/$BaCl_2$).

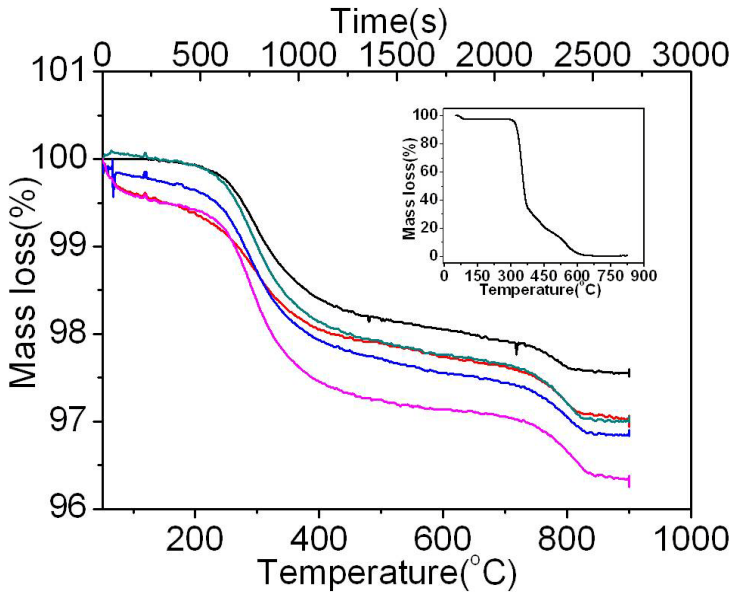

Figure S3. Thermal gravimetric analysis of the MSAH-functionalized $BaSO_4$ particles synthesized with different molar ratios of MSAH/$BaCl_2$ (a) and pure MSAH (inset). Black: 0 %, red: 0. 016, green: 0.032, blue: 0.064, pink: 0.128.

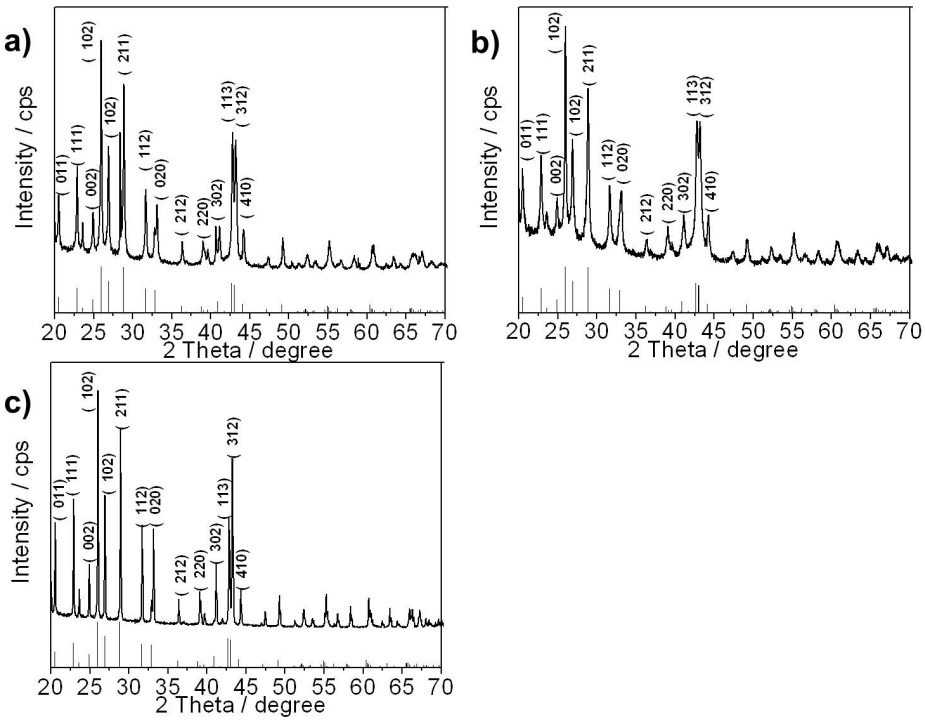

Figure S4. XRD of the surface functionalized $BaSO_4$ particles prepared with different surface modification a gents (a: MSAH, b: SMPS, c: AMSA, molar ratio of the surface modification agent over $BaCl_2$: 0.016, pre-decomposition time: 1h.