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A Room Temperature, Templated Synthesis of Lanthanide Trifluoride Nanoparticles and their unusual Self-assemblies

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Rheology: Dynamic rheological measurements were done on the gels on an AR 1000 rheometer (TA instruments) using a plate-plate geometry. Tb(III) (5 mM)/ sodiumcholate(15 mM) gel was used for all the rheological measurements. For ensuring homogeneity of the system, the gel preparations were slightly altered. Instead of diffusing the NaF solution through the gel, all the constituents were premixed, sonicated (for 10 sec) and stabilized for 2 h before loading onto the plate geometry of the rheometer. Two types of rheology experiments were performed to extract information about the material properties of the lanthanide cholate gels 1) Frequency sweep at a fixed oscillatory stress of 1.0 Pa and 2) stress sweep at a fixed frequency of 1.0 Hz.

Frequency Sweep experiments:

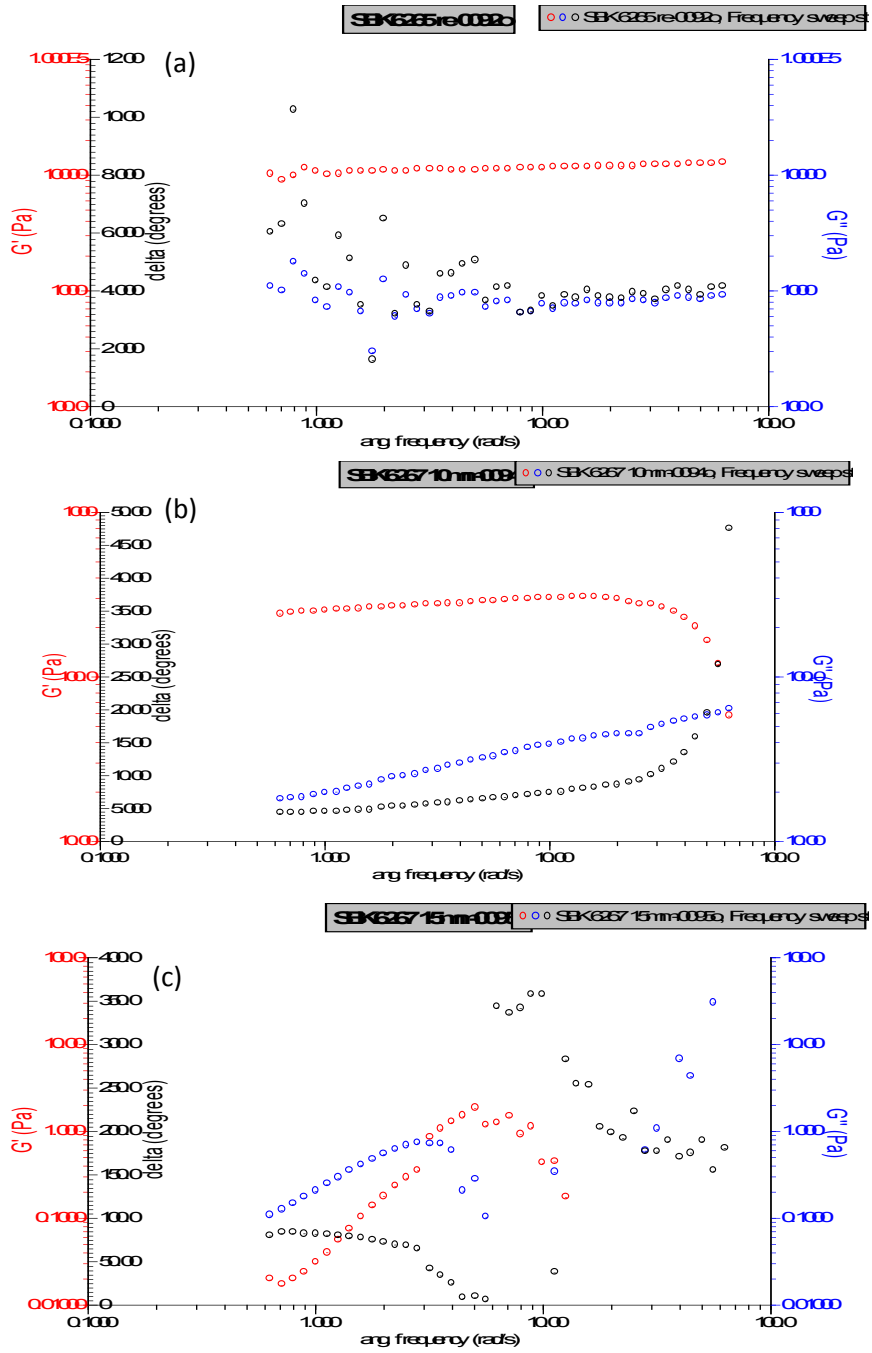

Fig S1. Frequency sweep at a fixed oscillatory stress of 1.0 Pa for (5 mM: 15 mM) Tb/NaC gelwith a) 0 mMNaF; b) 10 mMNaF; c) 15 mMNaF.

Stress Sweep experiment:

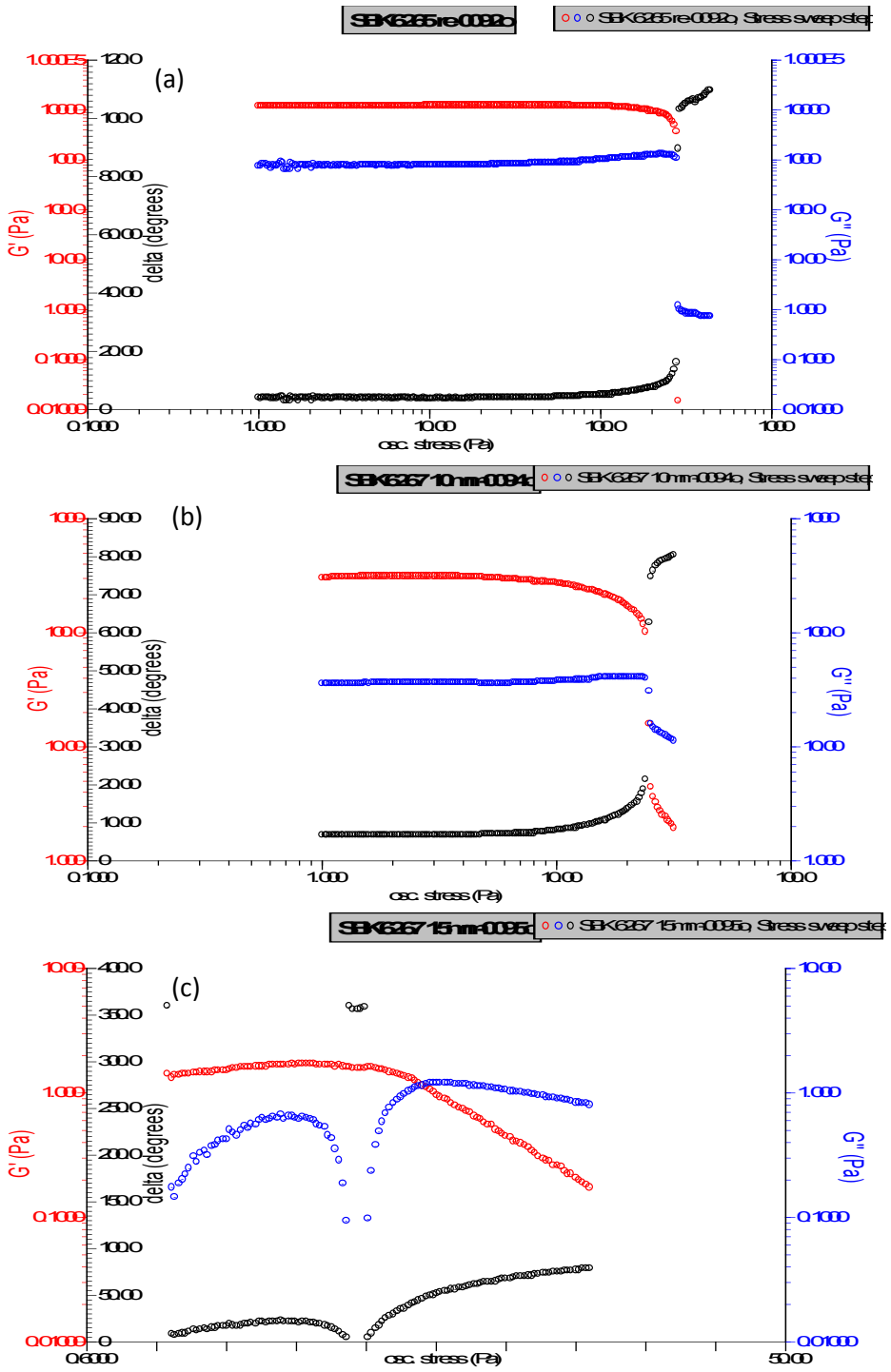

Fig S2. Stress sweep at a fixed frequency of 1.0 Hz for (5 mM: 15 mM) Tb/NaC gel with a) 0 mMNaF; b) 10 mMNaF; c) 15 mMNaF.

Dispersity of nanoparticles:

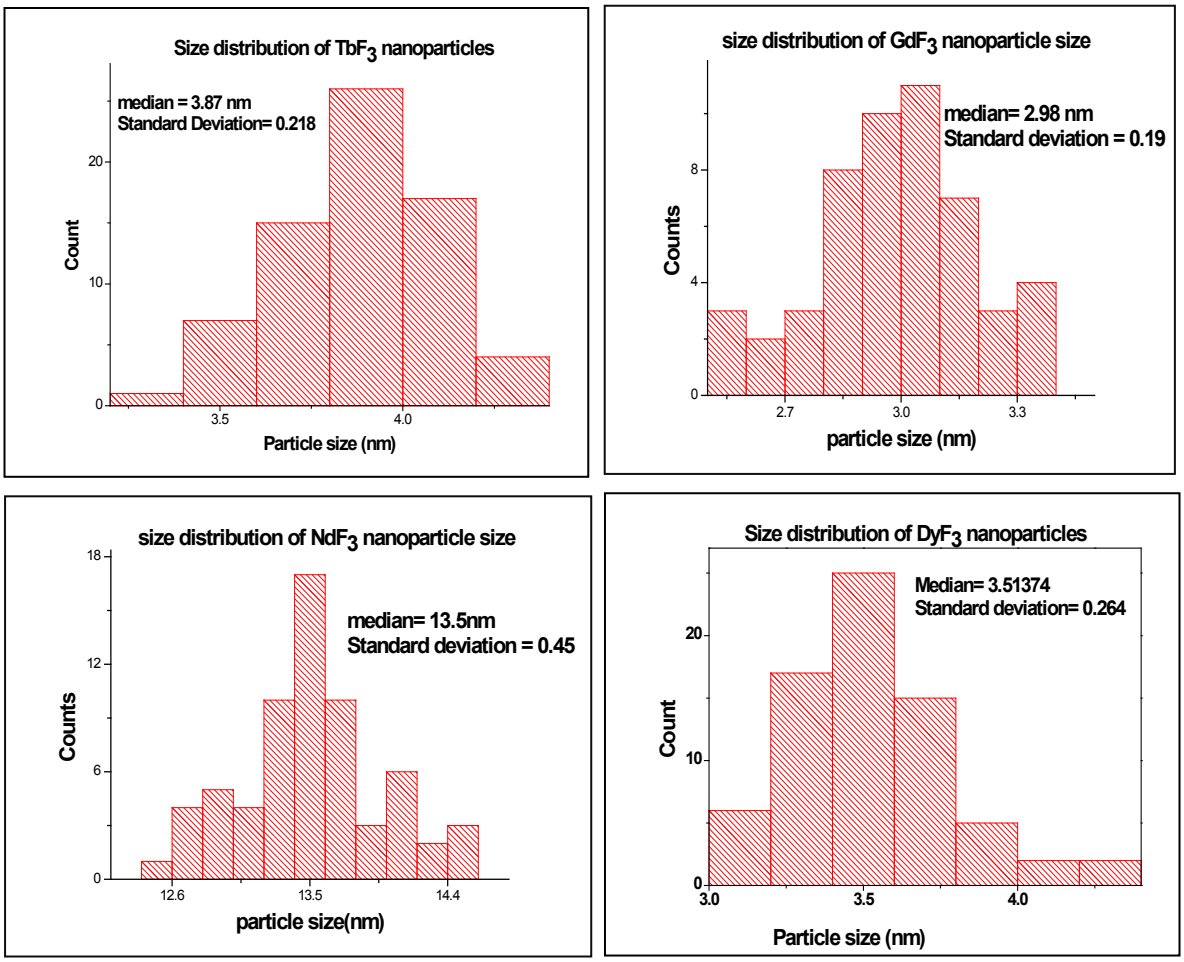

Fig S3. Histogram depicting the size distribution for a) TbF_3, b) GdF_3, c) NdF_3, d) DyF_3

Fluorescence spectra of the TbF_3 and EuF_3xerogels(Fig S5) were recorded on Perkin Elmer LS-50B (solid state) spectrophotometers in the phosphorescence mode (delay time 0.2 ms, gate time 3.0 ms, total decay time 20 ms) using a front face accessory (1.6 cm diameter).

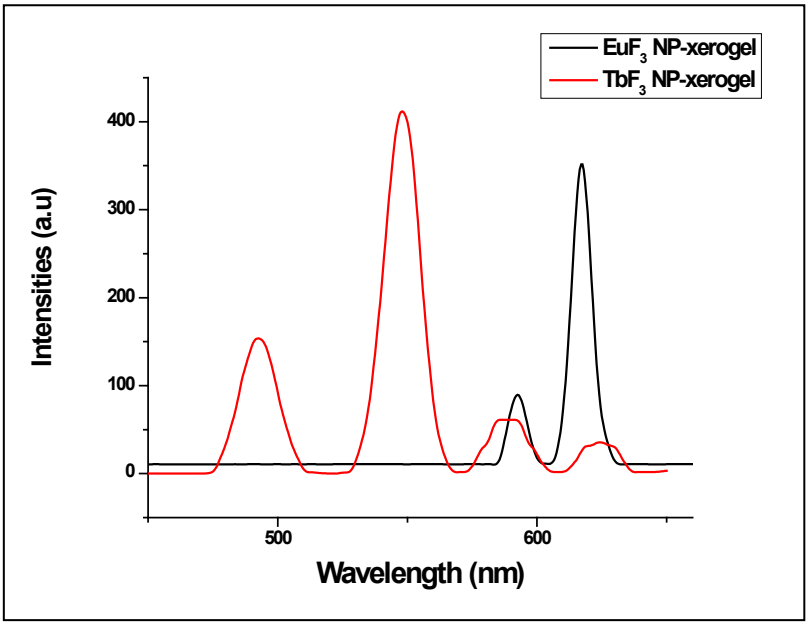

Fig S4. Time-delayed luminescence spectra (solid state) of EuF_3 and TbF_3xerogel-nanoparticle composites.

EDS spectra of LnF_3 nanoparticles: