Electronic Supplementary Material (ESI) for RSC Advances.

Highly water-dispersible calcium lignosulfonate-capped MnO nanoparticles as a T_1 MRI contrast agent with exceptional colloidal stability, low toxicity and remarkable relaxivity

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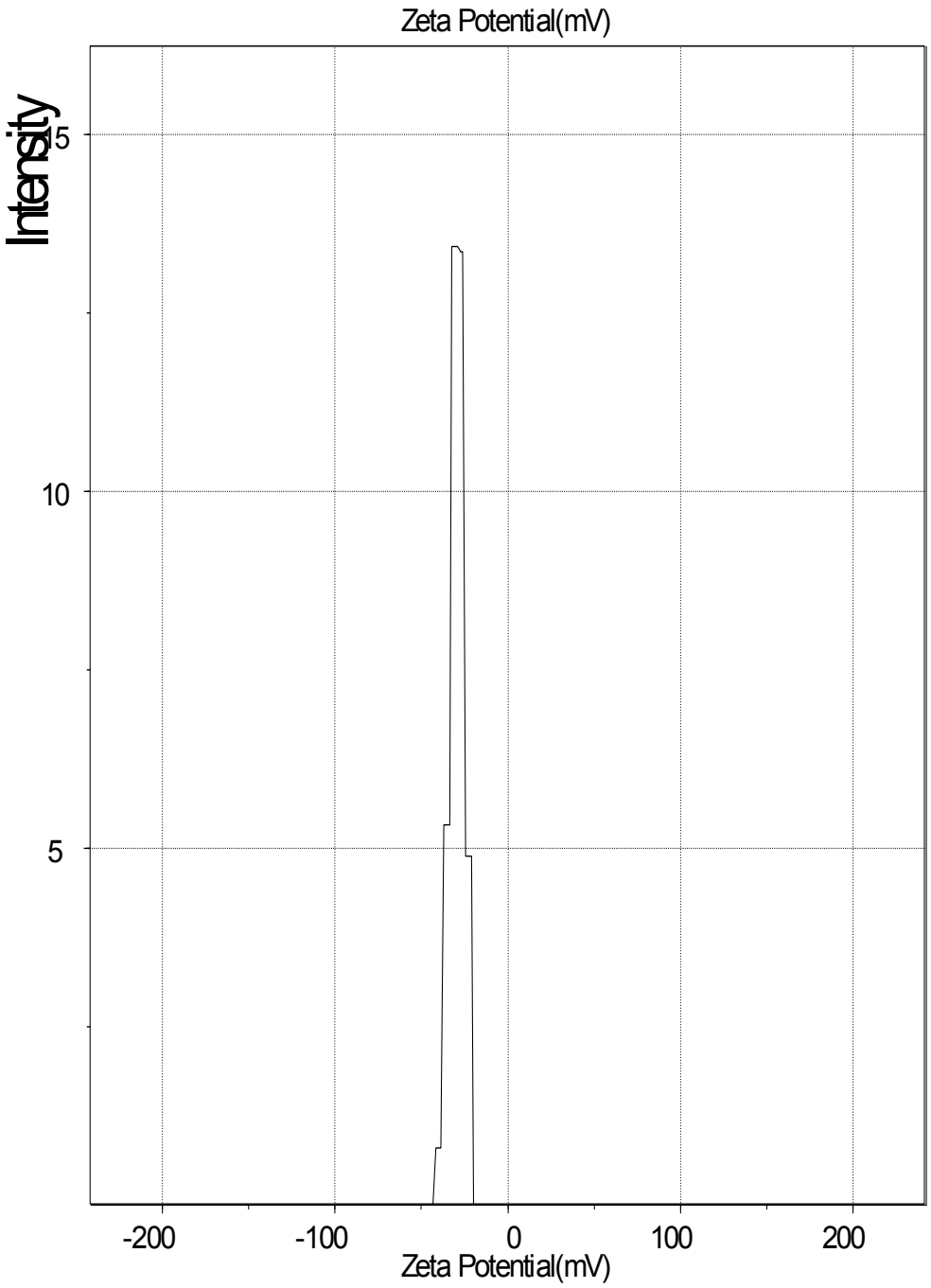

Figure S1. Zeta potential of hydrophilic manganese oxide nanoparticles with calcium lignosulfonate coating (MnO-CaLs NPs) depicts the surface charge is -29 mV.

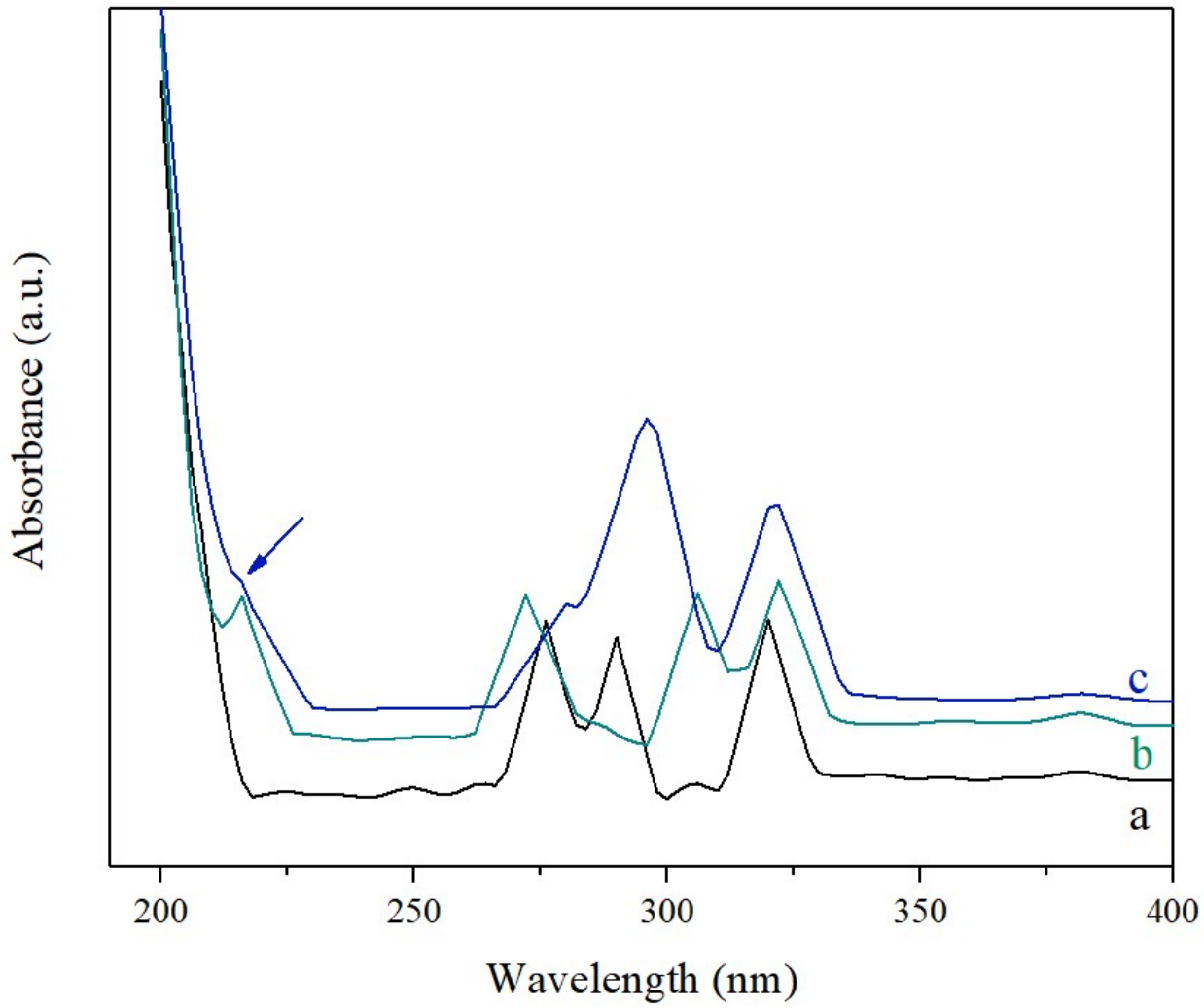

Figure S2. Solid-state UV absorption spectra: a) manganese oxide nanoparticles before phase transfer (with oleic acid coating); b) calcium lignosulfonate (CaLs); and c) manganese oxide nanoparticles after phase transfer (with calcium lignosulfonate coating) show a characteristic shoulders ($\lambda \approx 216$ nm), which attributed to CaLs coating on the MnO NPs surface (shown by arrow).

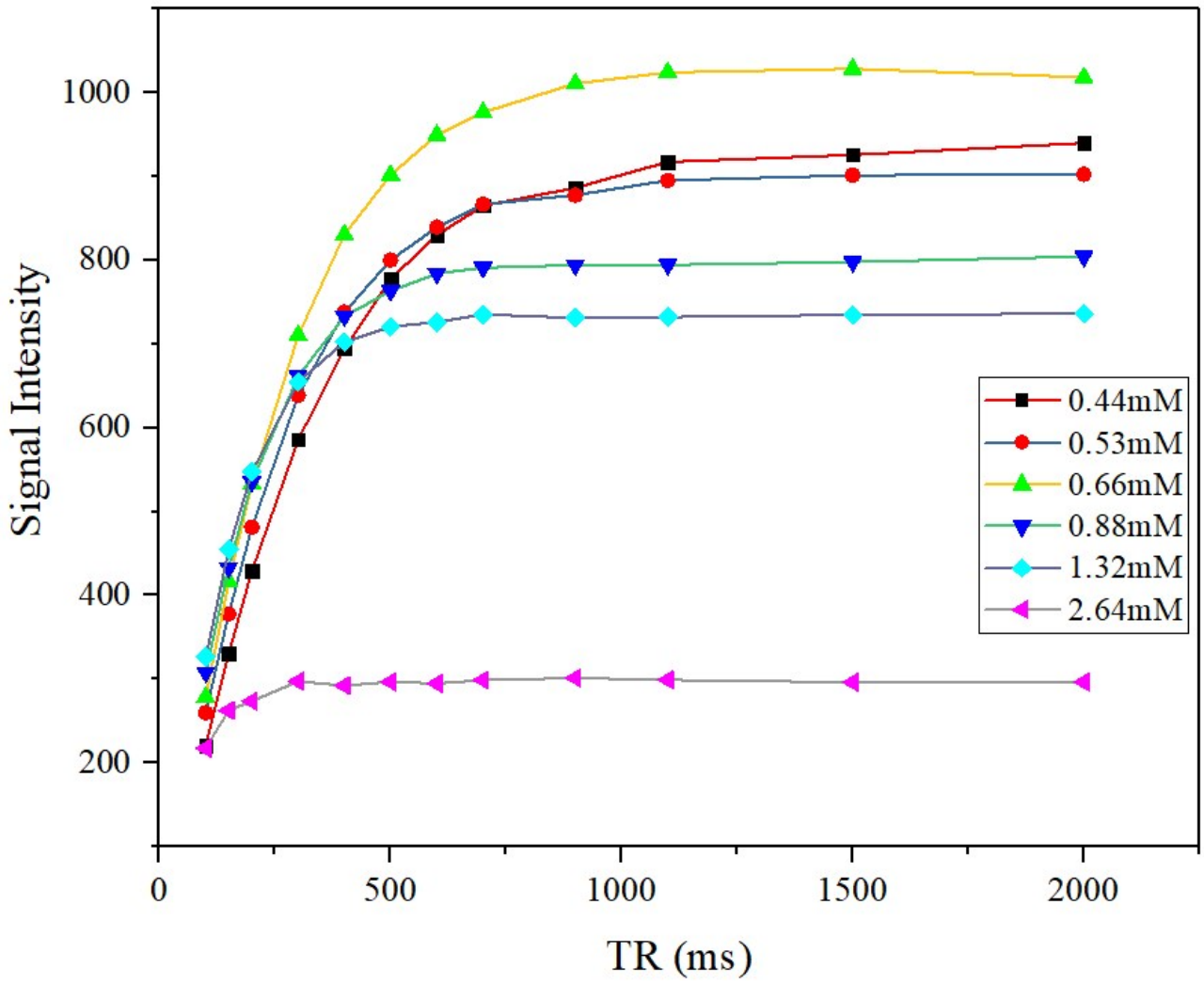

Figure S3. Signal intensity against TR in T_1-weighted MRI images (longitudinal relaxation) for different concentration of manganese ion, which maximum signal intensity was observed at 0.66 mM.

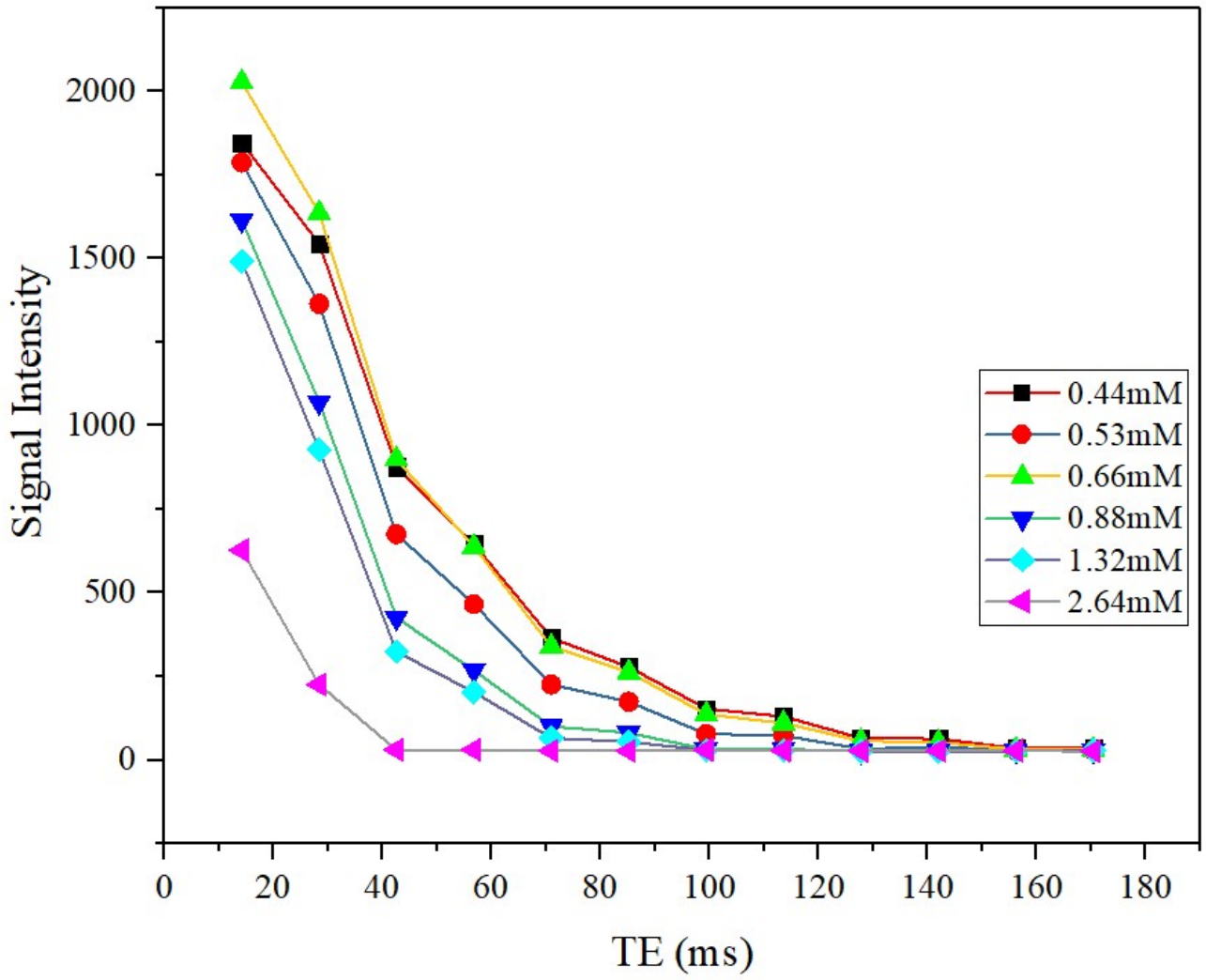

Figure S4. Signal intensity against TE in T_2-weighted MRI images (transverse relaxation) for different concentration of manganese ion.