Improving the adsorption capacity for ovalbumin by functional modification of aminated mesoporous silica nanoparticles with tryptophan

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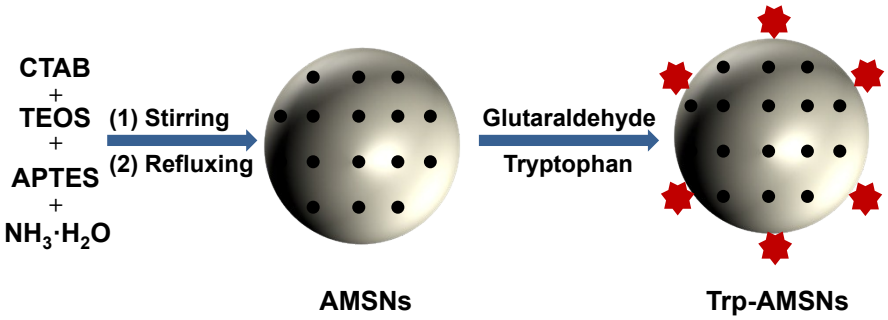
Electronic Supplementary Information



Scheme S1. Schematic illustration for the preparation of Trp-AMSNs.

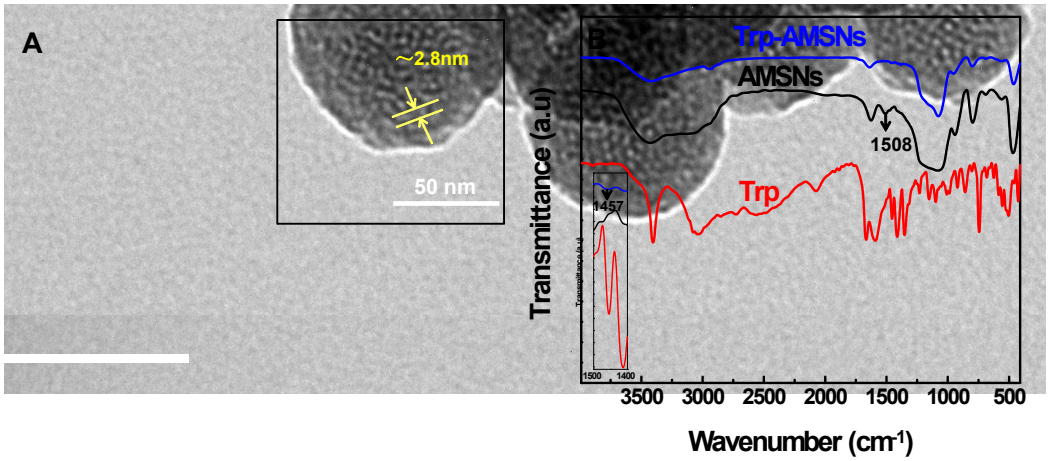


Fig. S1. (A) SEM and TEM (inset) images of AMSNs; (B) FT-IR spectra of AMSNs, Trp and Trp-AMSNs. The inset shows the area corresponding to the aromatic ring vibration mode (1500–1400 nm).

FT-IR spectra of AMSNs, Trp and Trp-AMSNs are illustrated in Fig. S1B. As for the AMSNs, the absorption band at 1084 cm^{-1} is assigned to the antisymmetric stretching vibration of Si-O-Si and the absorption at 1058 cm^{-1} is ascribed to the bending vibration of N-H. In the spectrum of Trp-AMSNs, the absorption band at 1058 cm^{-1} is diminished, demonstrating partial consumption of amino groups in AMSNs by grafting of Trp. A new absorption band at 1457 cm^{-1} in accordance with aromatic ring vibration of Trp is observed. These observations well demonstrate the incorporation of Trp into AMSNs.

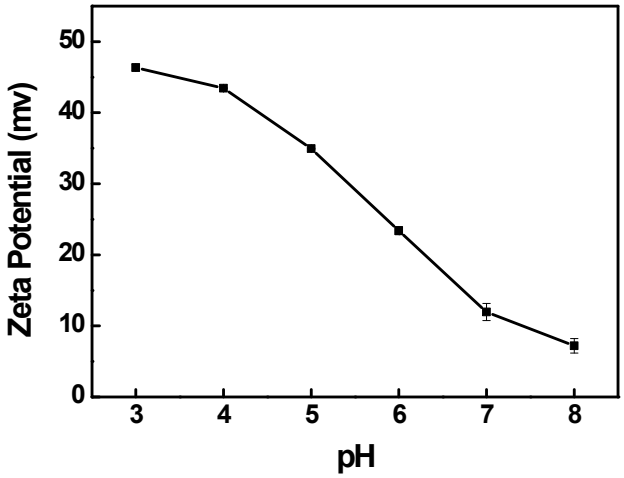


Fig. S2. Zeta potentials of Trp-AMSNs within pH 3.0-8.0.

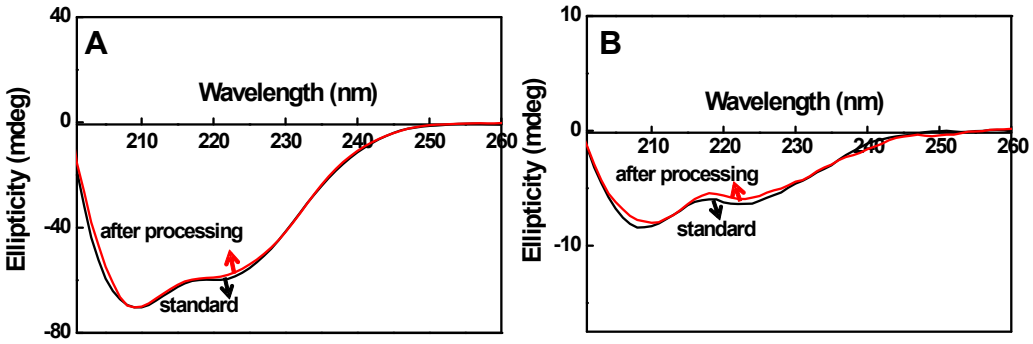


Fig. S3. CD spectra of Ova standard solution and that after processing by Trp-AMSNs and recovered in a 0.5% (m/v) SDS medium (A); and CD spectra of Lys standard solution and that after processing by Trp-AMSNs.

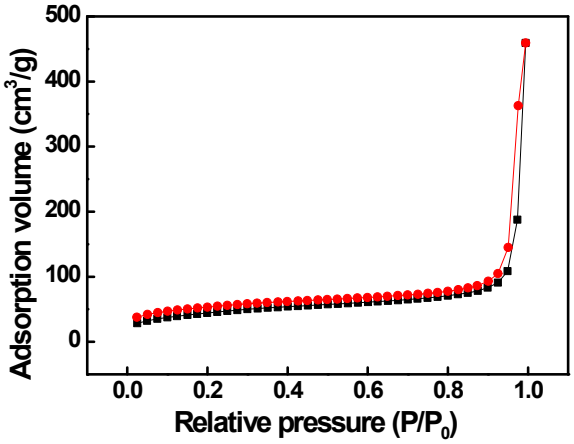


Fig. S4. N_2 adsorption/desorption isotherms of AMSNs.

Table S1. Elemental contents of AMSNs and Trp-AMSNs.

Element	Content in AMSNs (wt%)	Content in Trp-AMSNs (wt%)
O	37.95	35.52
Si	47.93	41.48
C	11.97	20.47
N	2.15	2.53