

Supporting Information of

Freezing-assisted reverse microemulsion synthesis of hollow mesoporous silica encapsulated glucose oxidase

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1. Materials and Methods

1.1. Element mapping analysis

TF-G20 high resolution TEM (Thermo Fisher Scientific, USA) was applied to characterize GOx@HMSNs morphology and analyzed the distribution of Si, O and N.

1.2. Assay for GOx activity

The GOx activity was determined according to previous literature. Briefly, pure GOx, GOx@HMSNs fresh sample and its storage with the equivalent GOx content, and HMSNs fresh sample as well as its storage were studied. The storage condition was under 75%RH and room temperature. Then, a known amount of samples were reacted with 100 mM glucose in 0.2 M phosphate buffer (pH7) for 10 min at 26°C. Then, the supernatant of sample was harvested by centrifugation at 12000 rpm for 10 min. Next, a known aliquot of the supernatant was mixed with an assay mixture containing 10 units of horseradish peroxidase, 0.2 mM dye 4-aminoantipyrine, and 2.5 mM phenol. Afterwards, the resultant pink quinoneimine complex in these samples was measured using UV-vis spectrophotometry at 510 nm. Through analyzing the dilution factor and a calibration plot, the relative activity of GOx could be obtained via setting the absolute activity of free GOx as 100%, all other samples were calculated by comparison and obeyed the protocol.

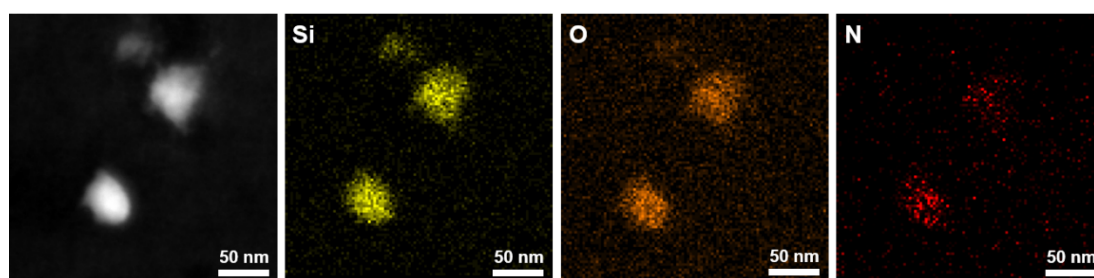


Fig. S1. Element mapping for silicon, oxygen, nitrogen of GOx@HMSNs.

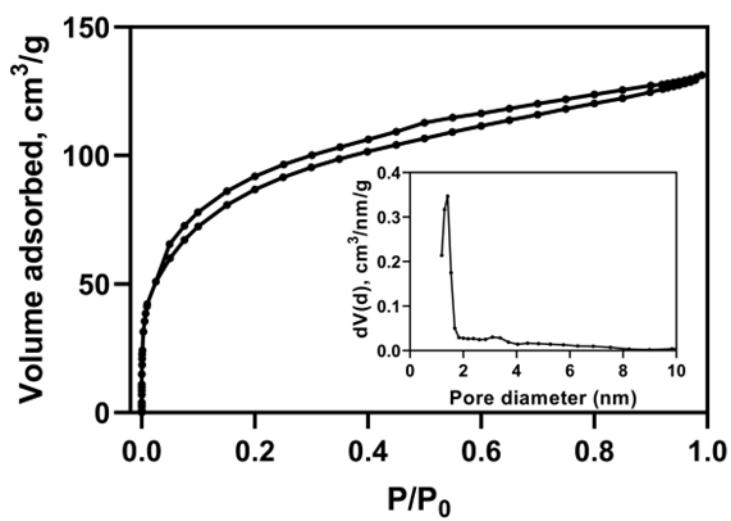


Fig. S2. N₂ adsorption-desorption isotherm curves and corresponding pore size distribution curve of GOx@HMSNs.

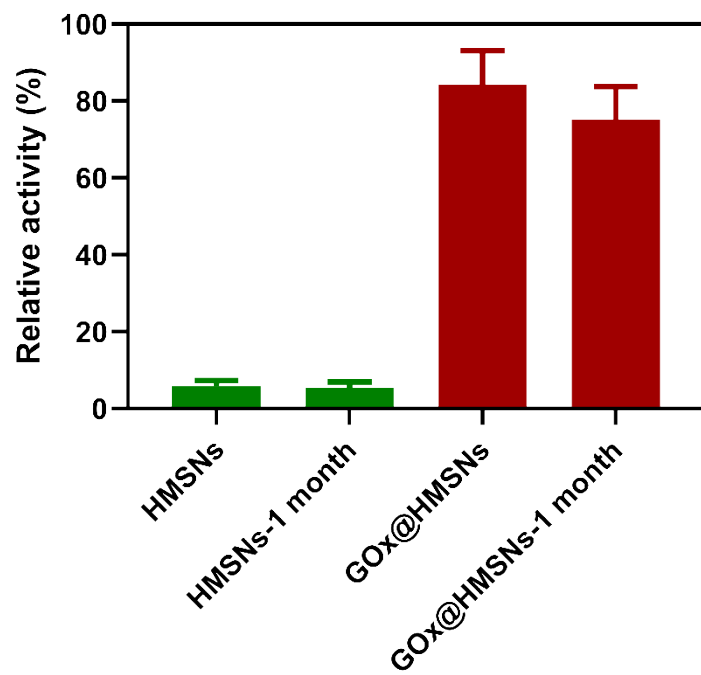


Fig. S3. The enzyme activity of GOx@ HMSNs before and after one month storage