# Supplementary Information

## Role of microporous Janus silica nanosheets in assembly of ultra-small Ag nanoparticles with high catalytic activity

Mengnan Yang, Zhaoli Yan*, Tiantian Li, Bing Liu, Qiangshan Jing*, Peng Liu

*Henan Province Key Laboratory of Utilization of Non-metallic Mineral in the South of Henan, College of Chemistry and Chemical Engineering, Xinyang Normal University, Xinyang 464000, China*

**AUTHOR INFORMATION**

**Corresponding Author**

***** Email: zhaoliyan@xynu.edu.cn (Z. Yan), 9jqshan@163.com (Q. Jing); Tel/Fax: +86-376-6390603

**Table S1** The main chemical composition of kaolinite and SiNSs samples.

| Samples | Main composition (wt.%) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | O | Si | Al | Fe | Ti | K | Ca | Na | Mg | P | S |
| Kaolinite | 49.66 | 25.92 | 21.71 | 0.43 | 0.26 | 0.61 | 0.09 | 0.05 | 0.11 | 0.12 | 0.70 |
| SiNSs | 52.96 | 45.64 | 0.66 | 0.07 | 0.43 | 0.06 | 0.01 | 0.02 | 0.04 | 0.01 | 0.01 |

**Table S2** Textural properties of kaolinite and SiNSs-1 samples.

| Samples | $S_{BET}$ ($m^2/g$) | $S_{micro}$ [b] ($m^2/g$) | $V_{tot}$ ($cm^3/g$) | $V_{micro}$ [b] ($cm^3/g$) | Average pore diameter (nm) |
|---|---|---|---|---|---|
| Kaolinite | 23 | 0 | 0.22 | 0 | 38.03 |
| SiNSs-1 [a] | 312 | 214 | 0.33 | 0.09 | 4.22 |

[a] The silica nanosheets (SiNSs-1) were prepared according to our previous work.

[b] The micropore surface areas ($S_{micro}$) and volumes ($V_{micro}$) were estimated by the t-plot method.

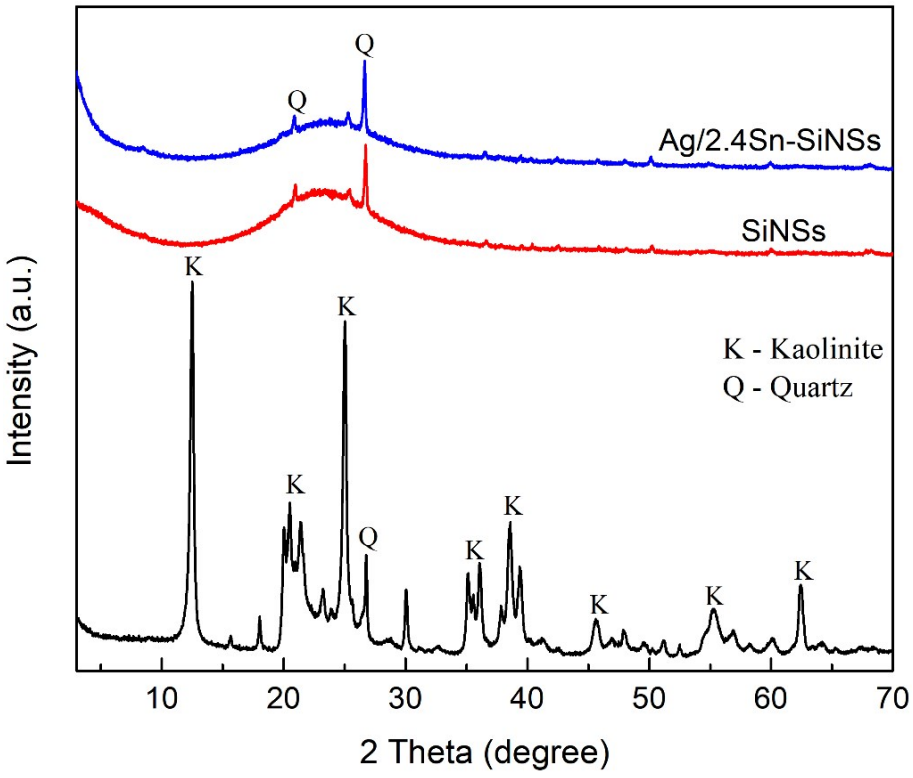


**Fig. S1** XRD patterns of kaolinite, SiNSs and Ag/2.4Sn-SiNSs samples.

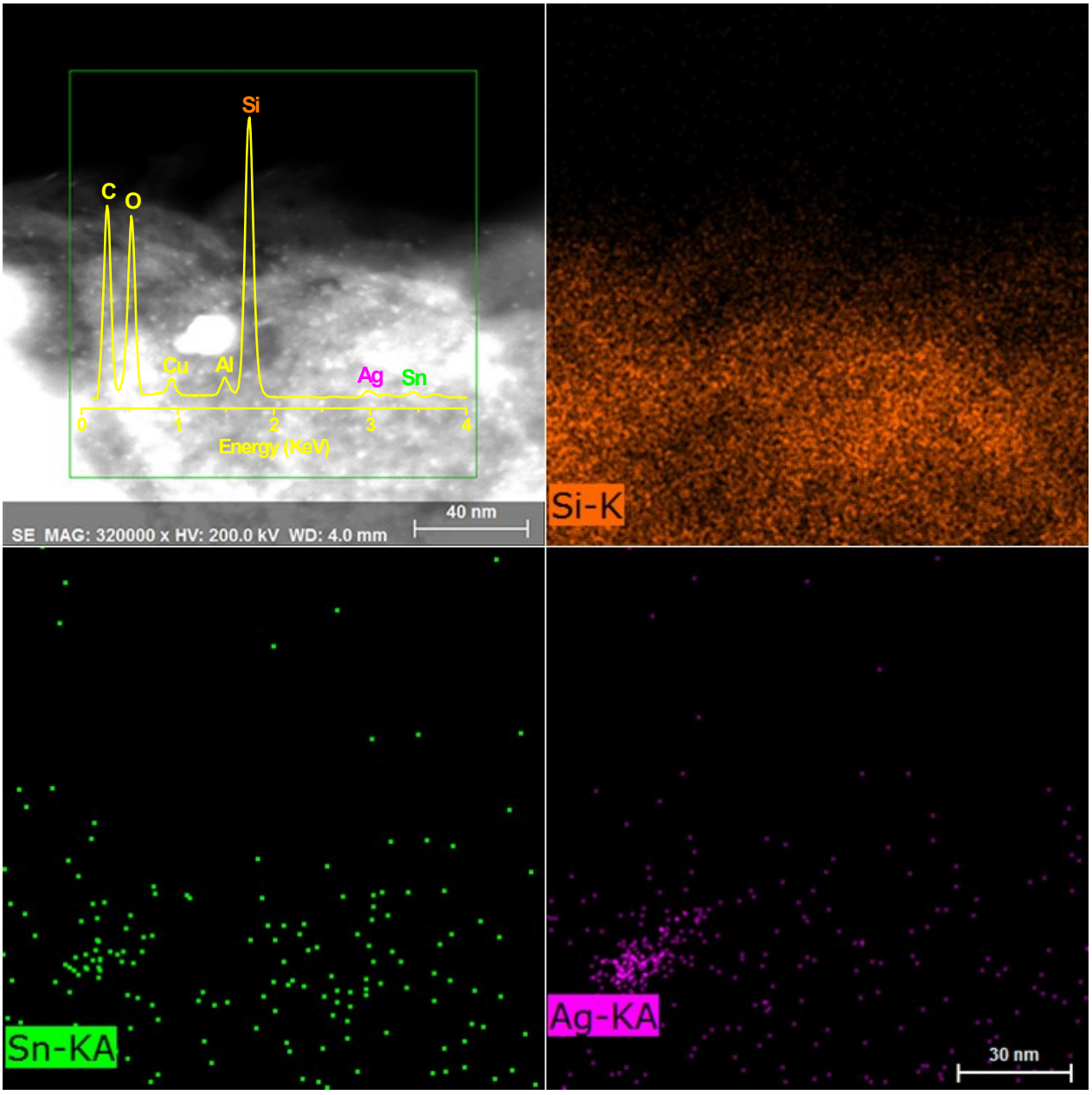


**Fig. S2** STEM image (inserted EDS spectrum) and the corresponding quantitative EDS maps for Si, Sn and Ag elements of Ag/2.4Sn-SiNSs sample.

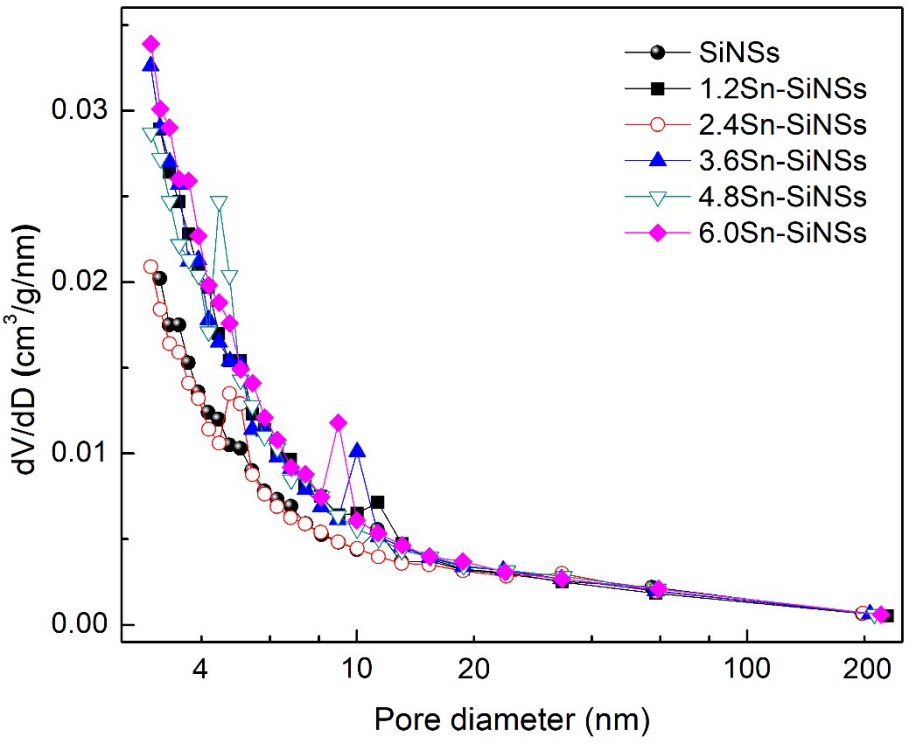


**Fig. S3** BJH pore size distribution curves of SiNSs and *x*Sn-SiNSs samples.