

ELECTRONIC SUPPLEMENTARY INFORMATION

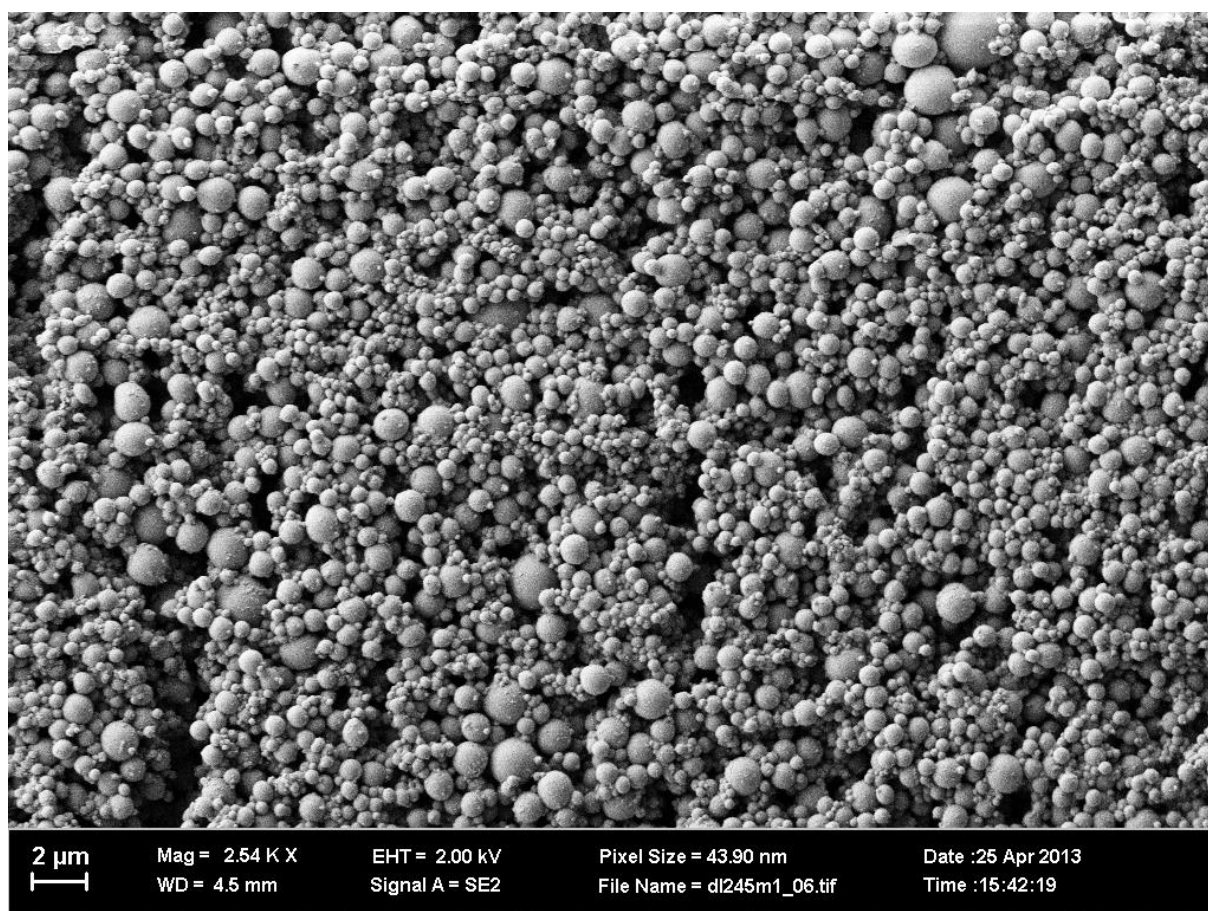
"Dirty nanostructures": Aerosol-assisted synthesis of temperature stable mesoporous metal oxide semiconductor spheres comprising hierarchically assembled zinc oxide nanocrystals controlled via doping.

Daniela Lehr, Dennis Großmann, W. Grünert and Sebastian Polarz*.

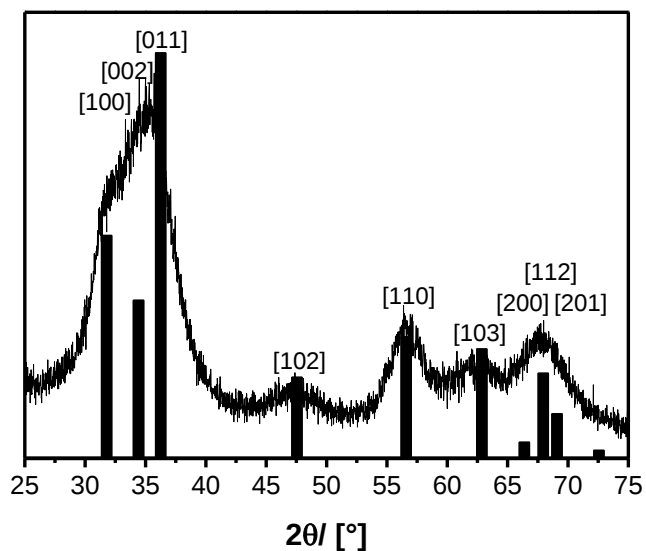
ESI-1

Additional analytical data for the amorphous ZnO particles obtained via the aerosol-assisted method.

SEM:

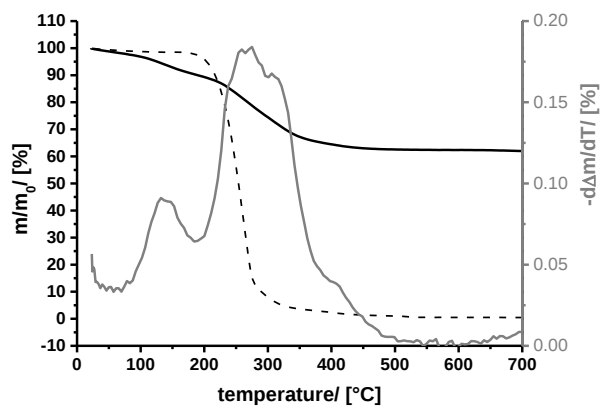


PXRD:



The black bars indicate the diffraction pattern for bulk ZnO in Wurtzite structure.

TGA (black) and first derivative (grey).

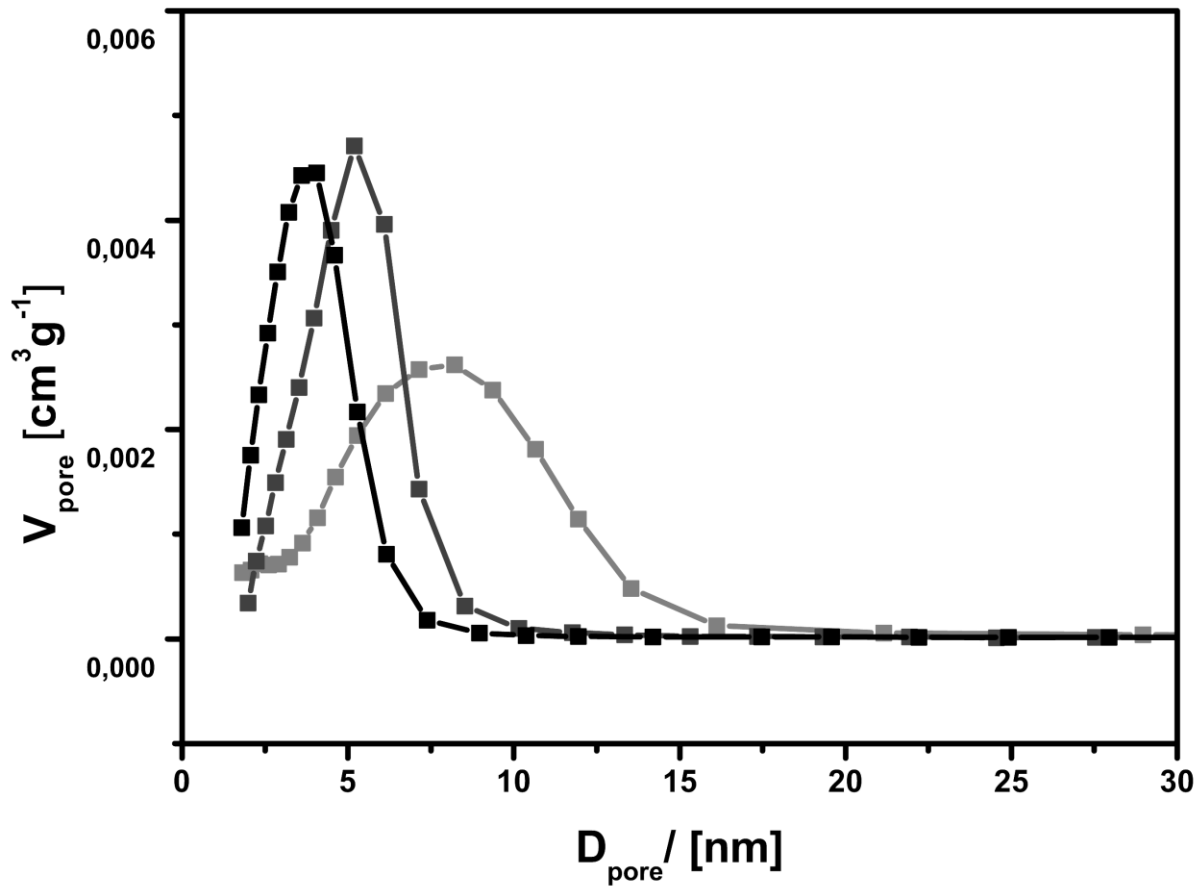


black, solid line $\cong$ amorphous ZnO spheres

black, dashed line $\cong$ Brij 58 as a reference

ESI-2

BJH pore-size distribution for mesoporous Al@ZnO prepared with different surfactants: Brij 58 (black), Pluronic P123 (dark grey) and Pluronic F 127 (grey)

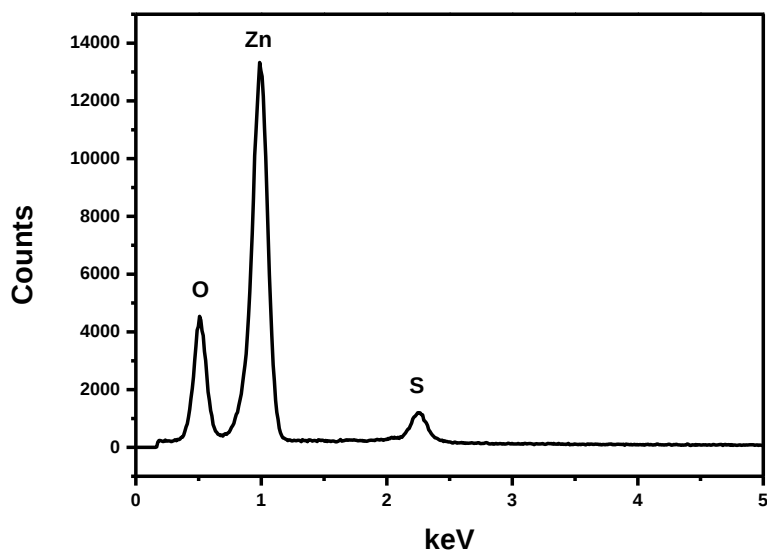
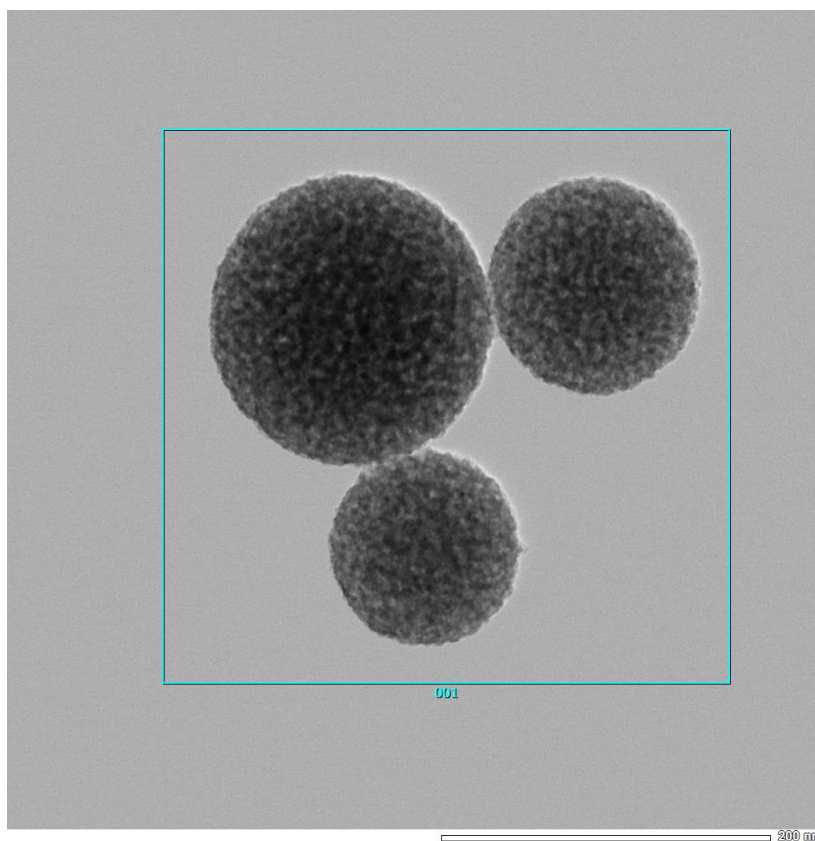


ESI-3

Additional analytical data for mesoporous E@ZnO spheres

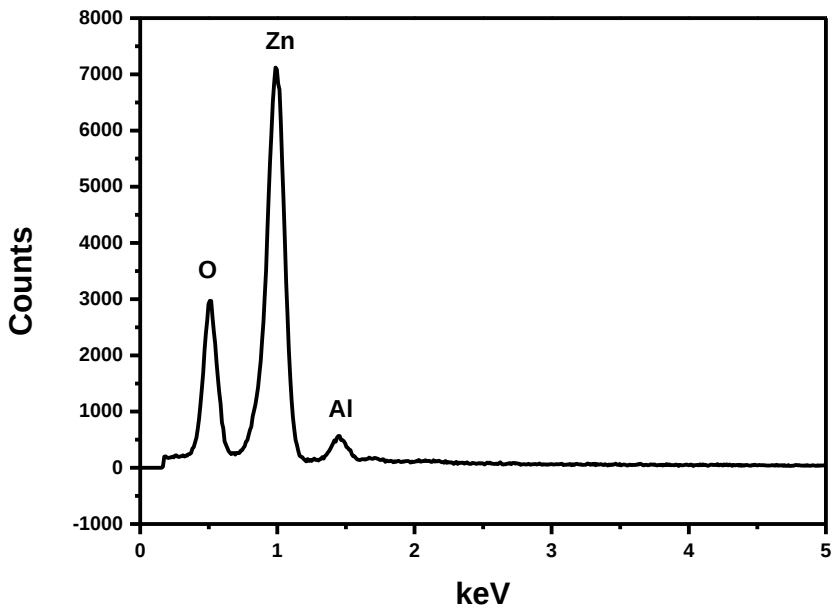
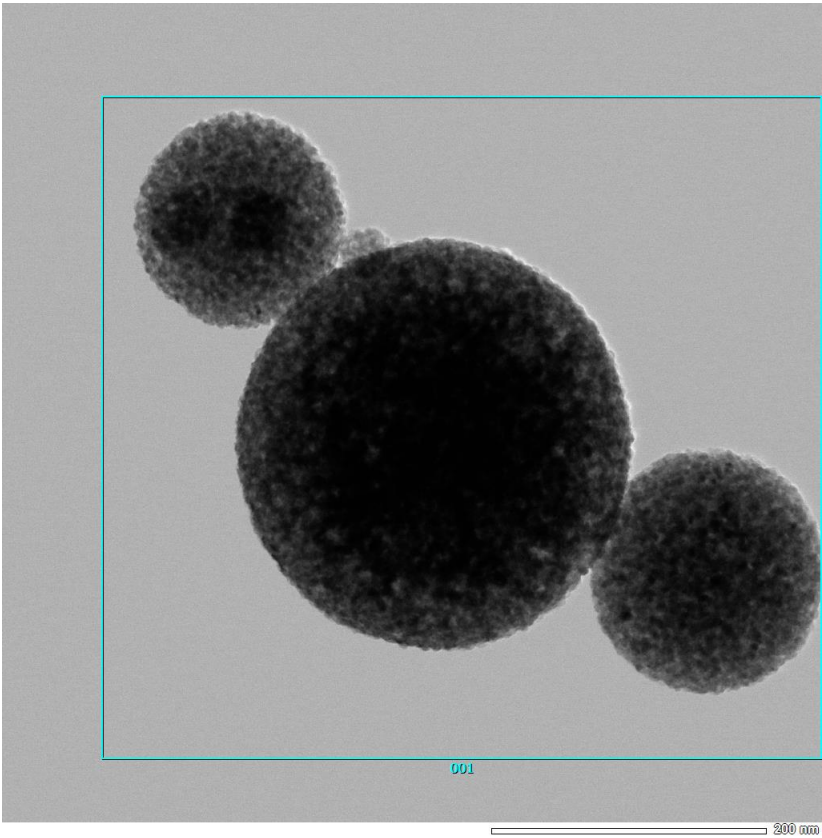
S@ZnO:

SA EDX:

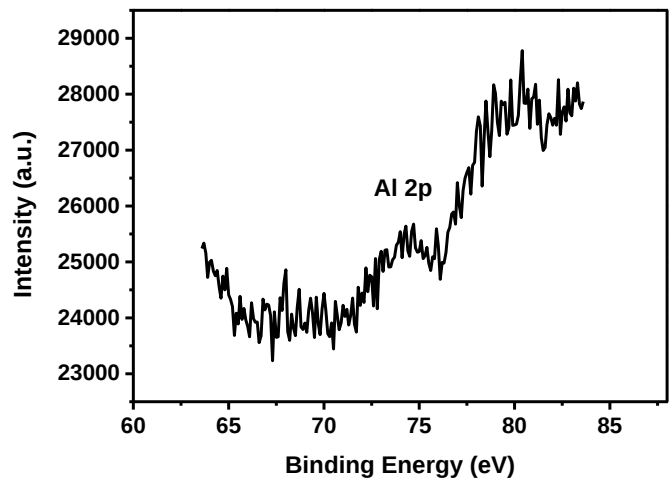


Al@ZnO:

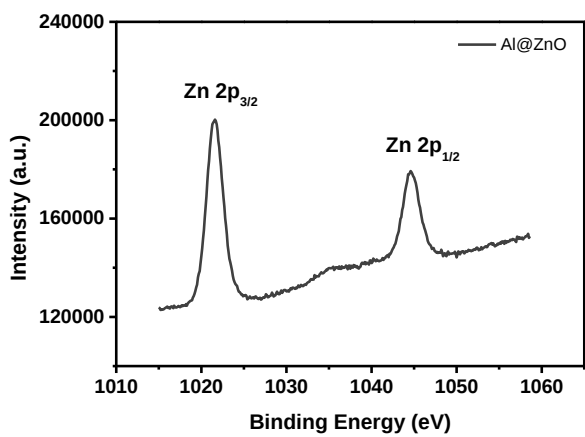
SA EDX:



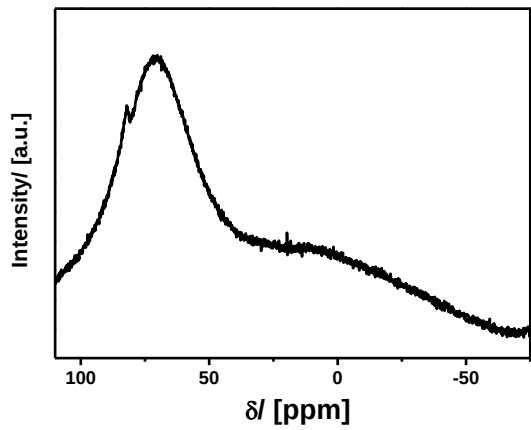
XPS-data of Al_{2p}:



XPS-data of Zn-2p_{3/2} and Zn-2p_{1/2}:

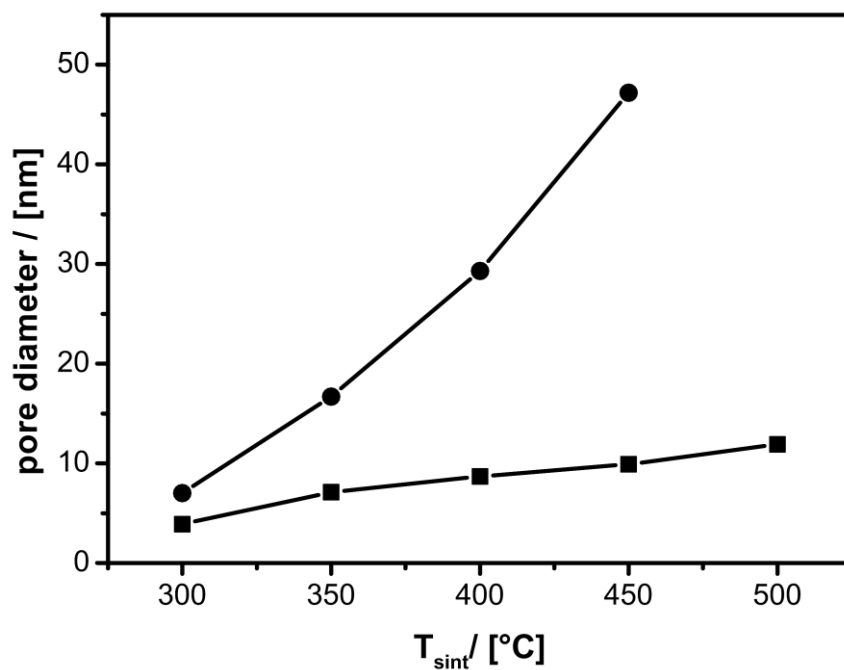


²⁷Al solid-state NMR:



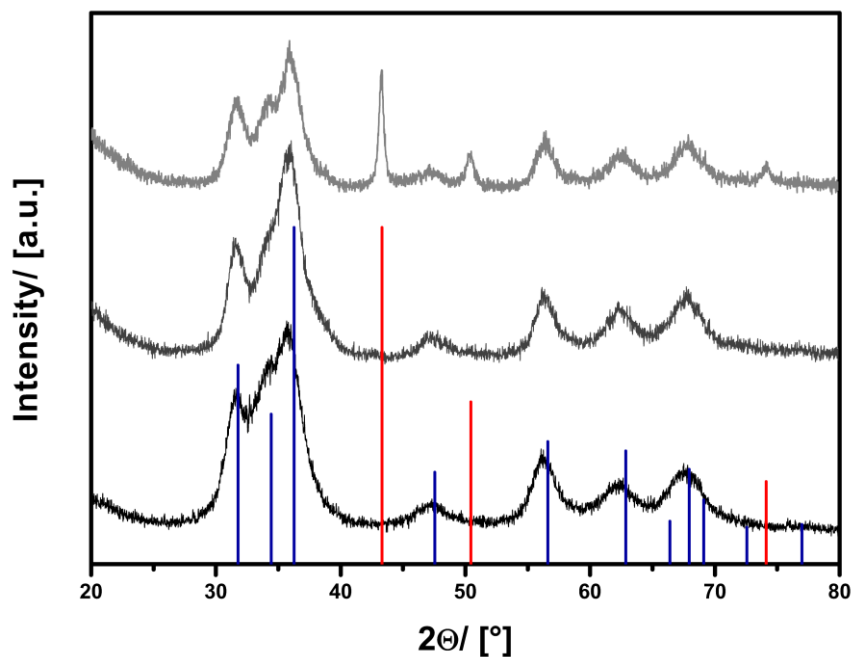
ESI-4

Correlation of the pore diameter as a function of sintering temperature: pure ZnO materials (circles) and Al@ZnO (squares).

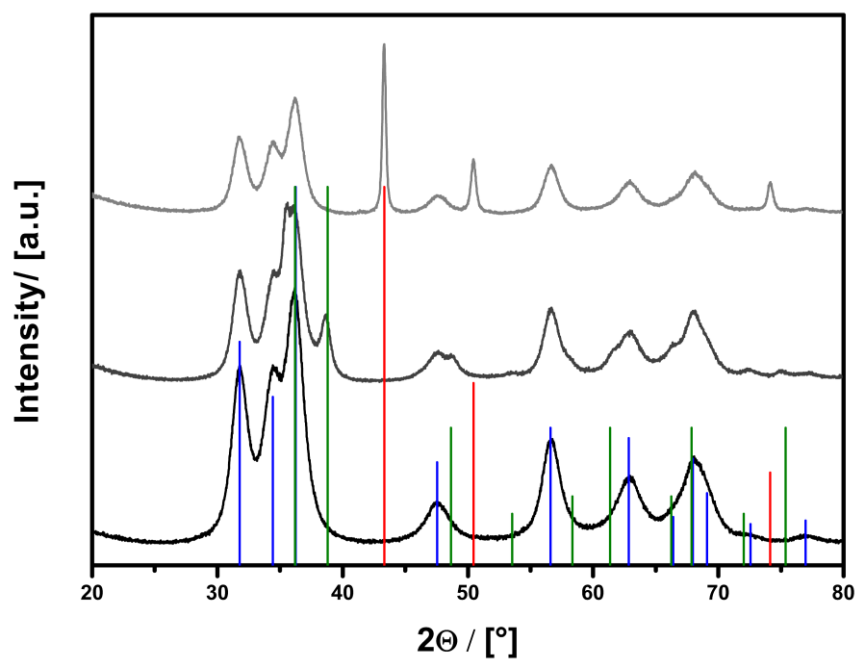


ESI-5

PXRD of porous S@ZnO spheres (black), and Cu loaded S@ZnO spheres before (dark grey) and after reduction with forming gas (grey). Reference patterns: ZnO (blue bars, ICDD: 01-070-8070), Cu (red bars, 01-085-1326)



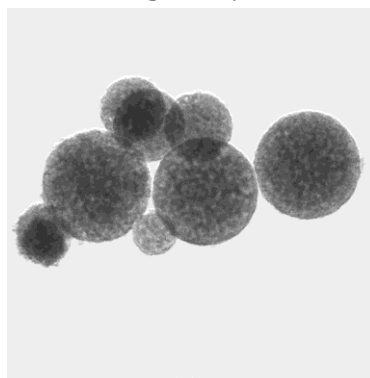
PXRD of porous Al@ZnO spheres (black), and Cu loaded Al@ZnO spheres before (dark grey) and after reduction with forming gas (grey). Reference patterns: ZnO (blue bars, ICDD: 01-070-8070), CuO (green bars, ICDD: 00-003-0884) Cu (red bars, 01-085-1326)



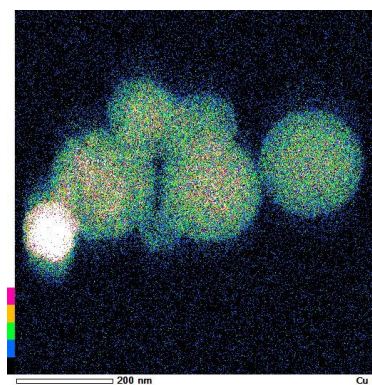
ESI-6

STEM-EDX mapping of Cu(II) loaded S@ZnO spheres.

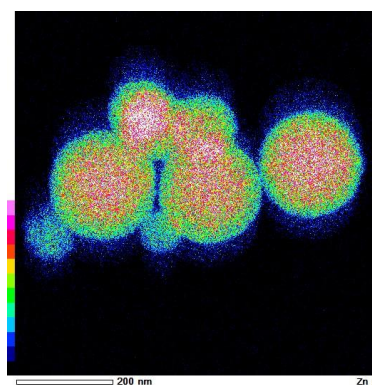
STEM:



Copper map:

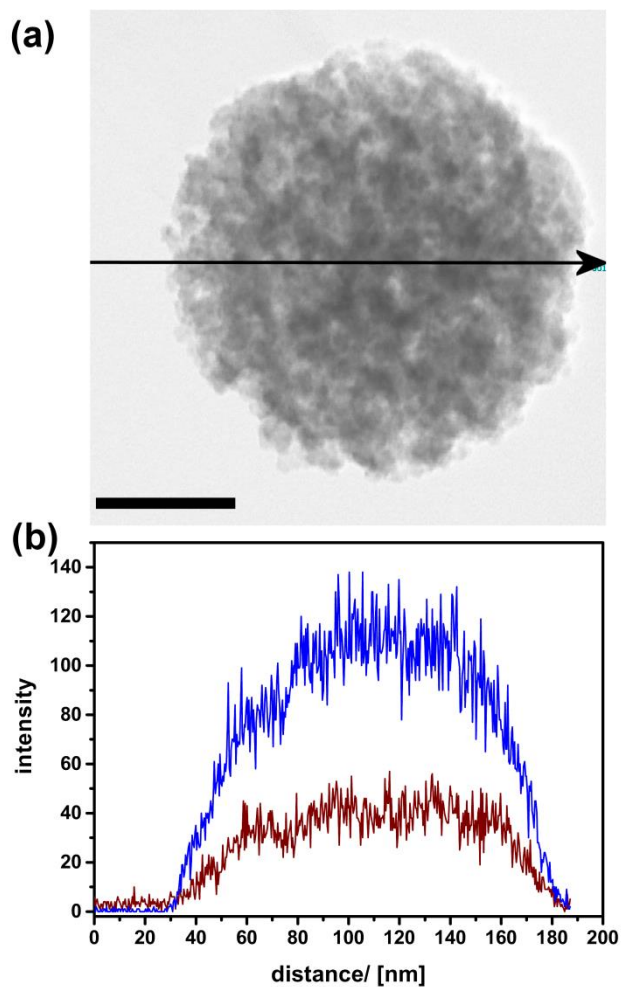


Zinc map:



ESI-7

STEM-EDX line scan of Cu(II) loaded S@ZnO spheres

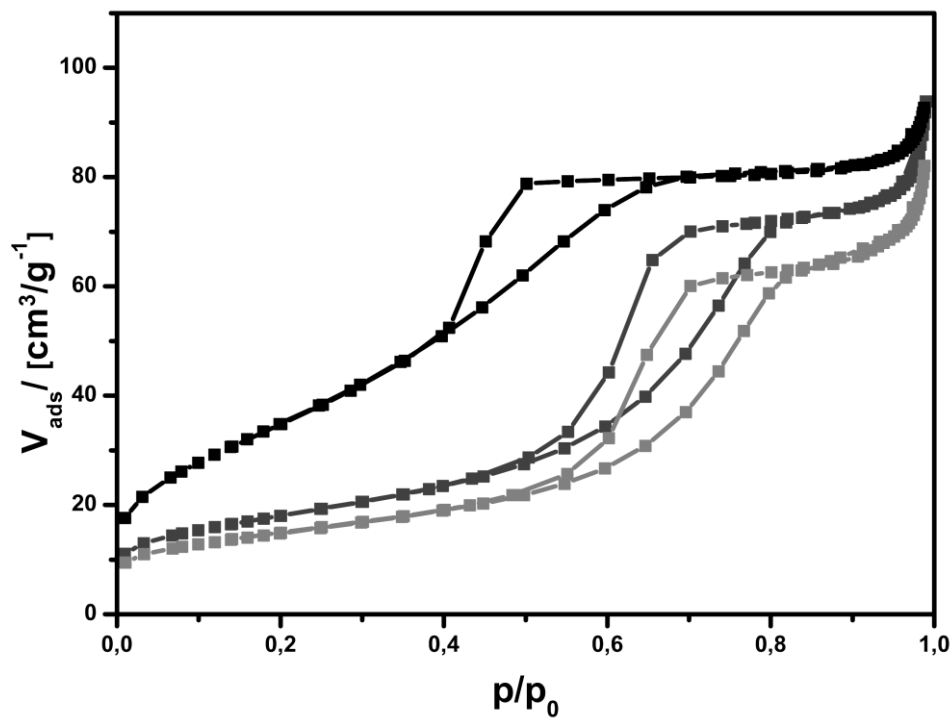


Scalebar 50 nm. The arrow indicates the trace for the EDX line scan.

(b) Results of the EXD line-scan measurement; (blue graph $\cong$ Zn_{Kα}; black graph $\cong$ Cu_{Kα}).

ESI-8

N₂ physisorption isothermes of porous S@ ZnO spheres (black), and Cu loaded S@ZnO spheres before (dark grey) and after reduction with forming gas (grey).



N₂ physisorption isothermes of porous Al@ZnO spheres (black), and Cu loaded Al@ZnO spheres before (dark grey) and after reduction with forming gas (grey).

