Electronic Supplementary Material (ESI) for Journal of Materials Chemistry

New opportunities in Stöber synthesis: Preparation of microporous and mesoporous carbon spheres

Jerzy Choma,[a] Dominik Jamioła,[a] Katarzyna Augustynek,[a] Michal Marszewski,[b] Min Gao,[c] and Mietek Jaroniec[b,*]

[a]*Institute of Chemistry, Military Technical Academy, 00-908 Warsaw, Poland,* [b]*Department of Chemistry and Biochemistry, Kent State University, Kent, Ohio, 44242, USA, and* [c]*Liquid Crystal Institute, Kent State University, Kent, Ohio, 44242, USA.*

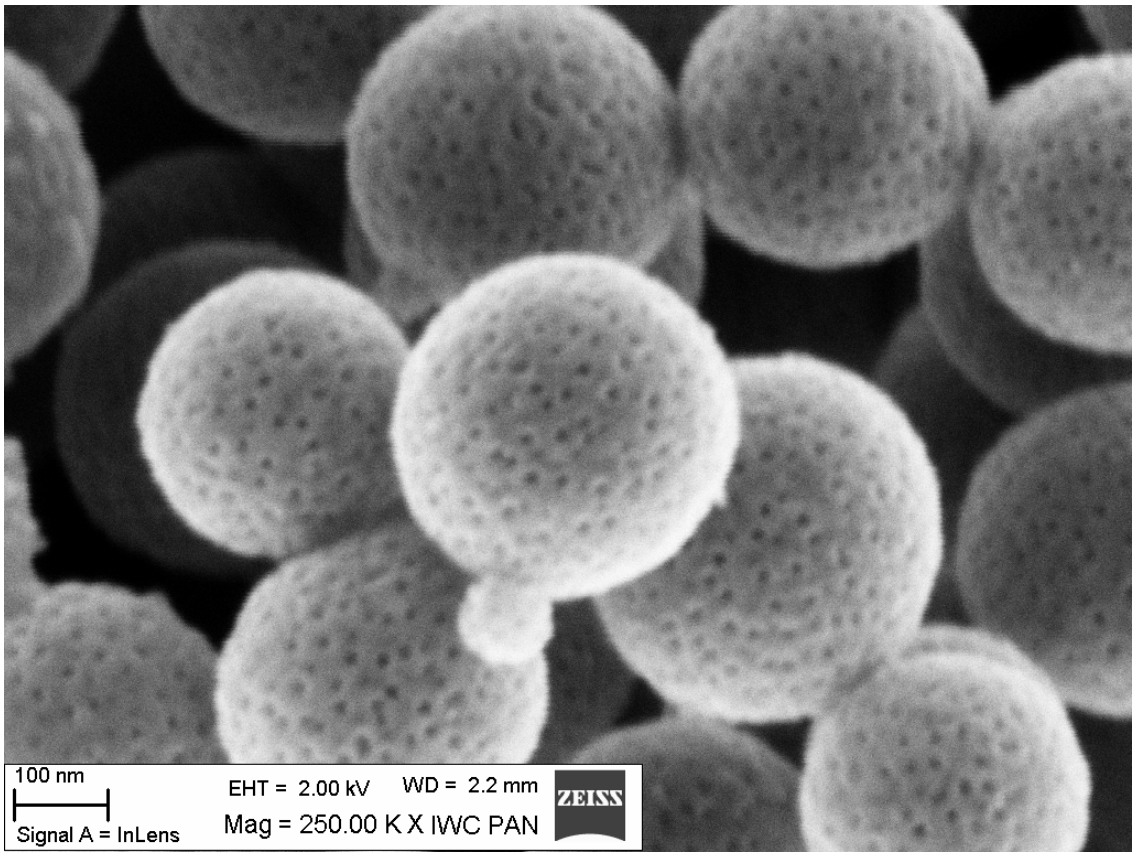

Figure S1. SEM image of carbon spheres obtained by block copolymer-assisted synthesis in the presence of 12 nm colloidal silica followed by dissolution of silica.

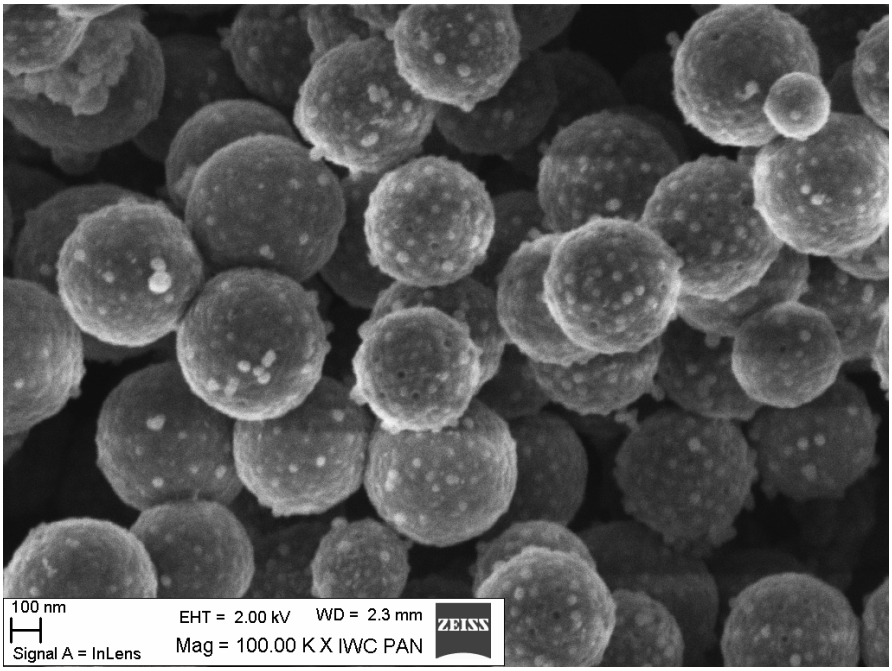

Figure S2. SEM image of silica-carbon composite spheres obtained by block copolymer-assisted synthesis in the presence of 24 nm colloidal silica.

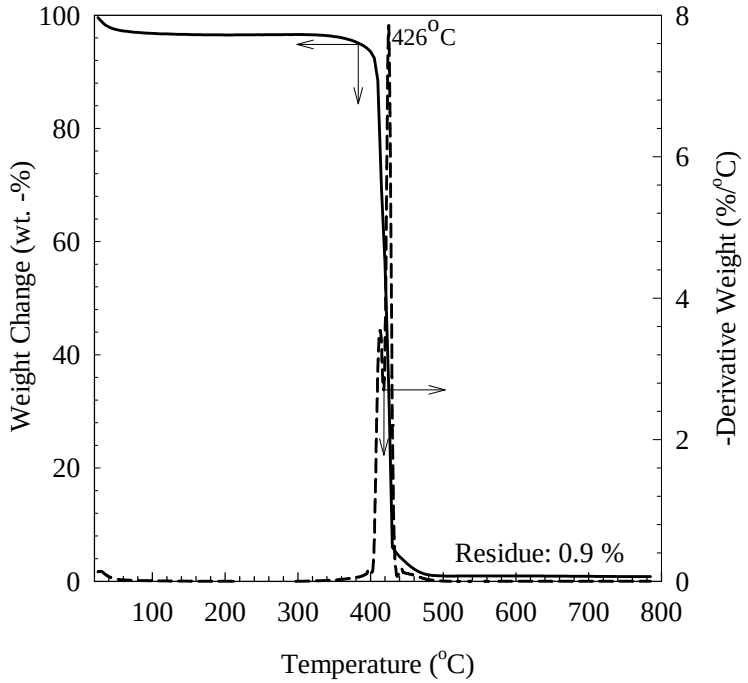

Figure S3. Thermogravimetric weight change profile and the corresponding DTG curve for microporous carbon spheres synthesized in the presence of TEOS recorded in flowing air.

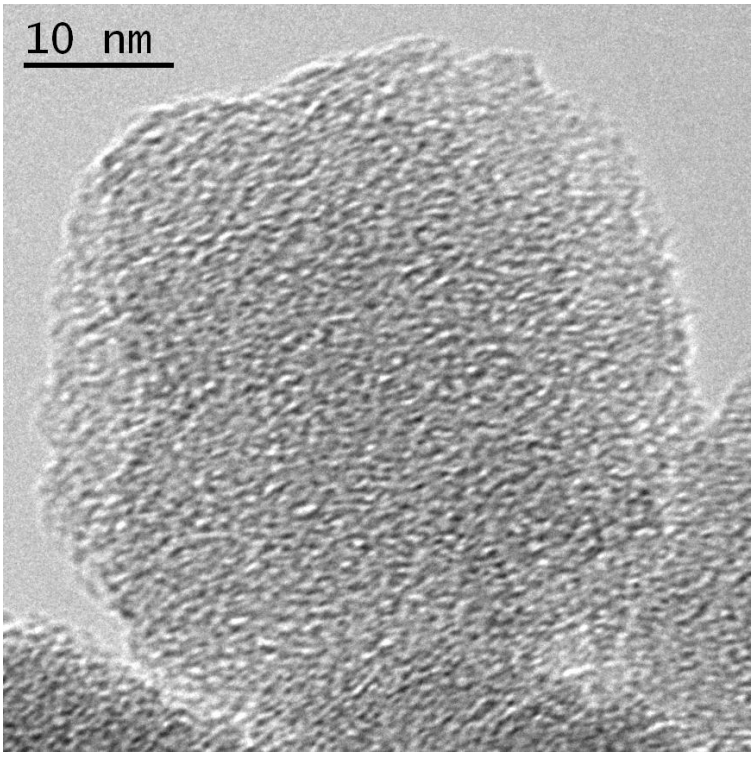

Figure S4. High-resolution TEM image of a single carbon sphere prepared in the presence of Pluronic F127 block copolymer (CS-P-0.4 g).

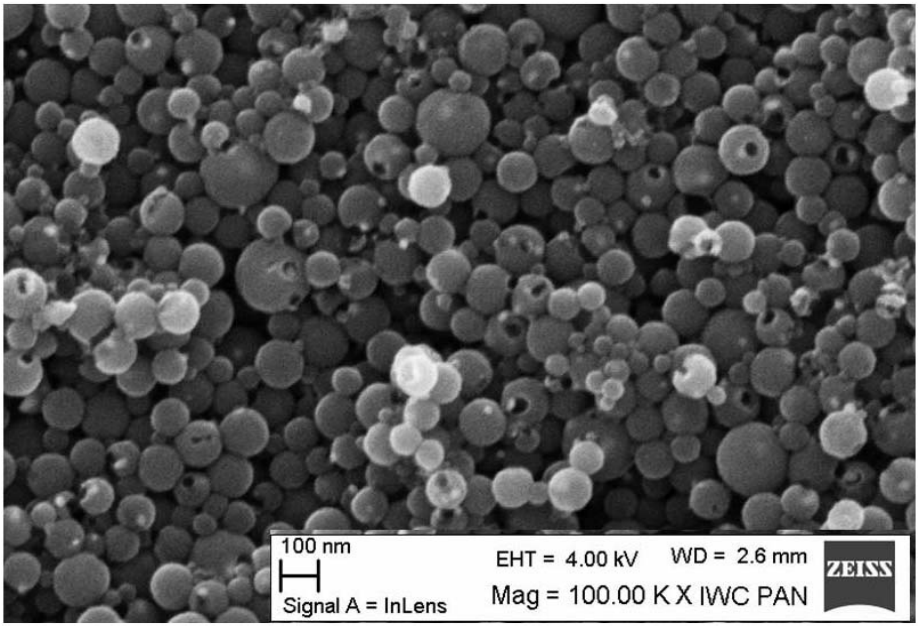

Figure S5. SEM image of mesoporous carbon spheres prepared in the presence of silver nitrate (CS-PAg*).

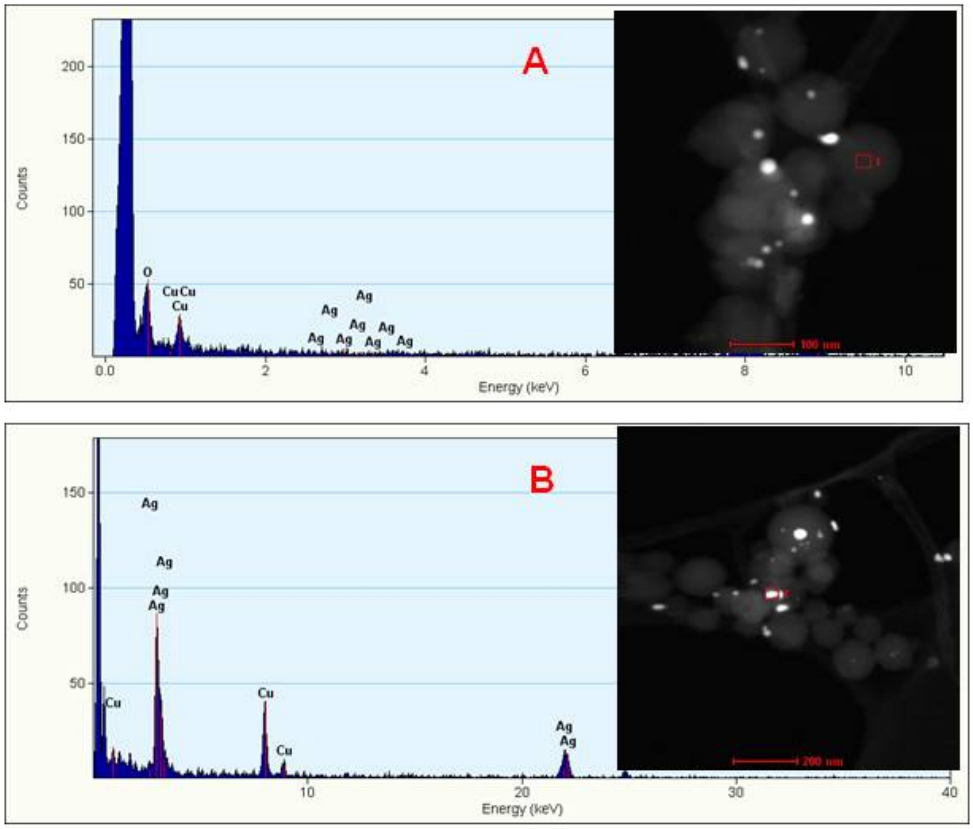

Figure S6. Z-contrast TEM images and the corresponding EDX spectra for the marked areas of carbon spheres without (panel A) and with (panel B) silver nanoparticles.

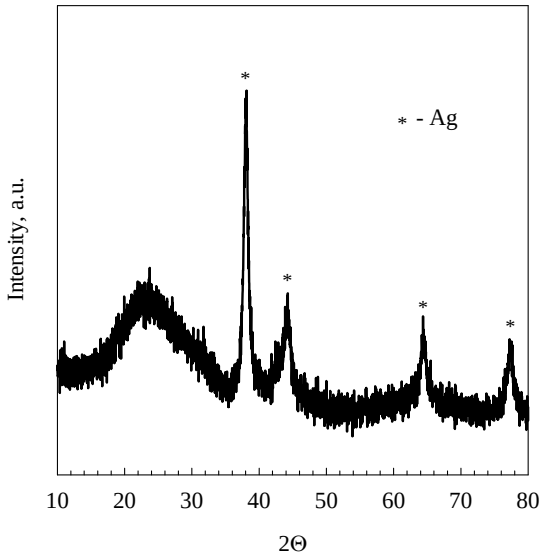

Figure S7. Wide angle XRD spectrum for mesoporous carbon spheres synthesized in the presence of block copolymer and silver nitrate (CS-PAg*).

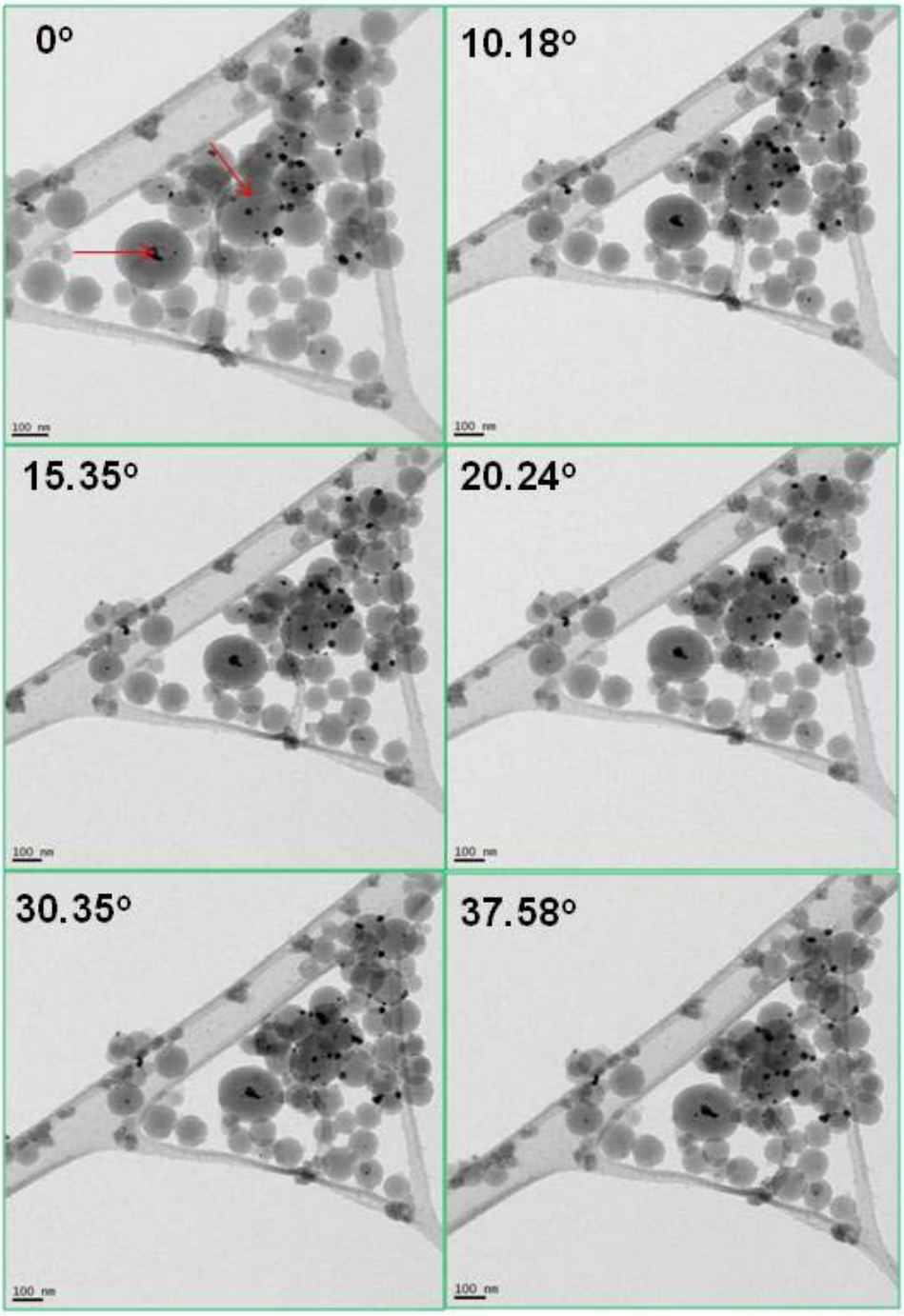

Figure S8. TEM images of carbon spheres with silver nanoparticles taken by varying the tilting angle.

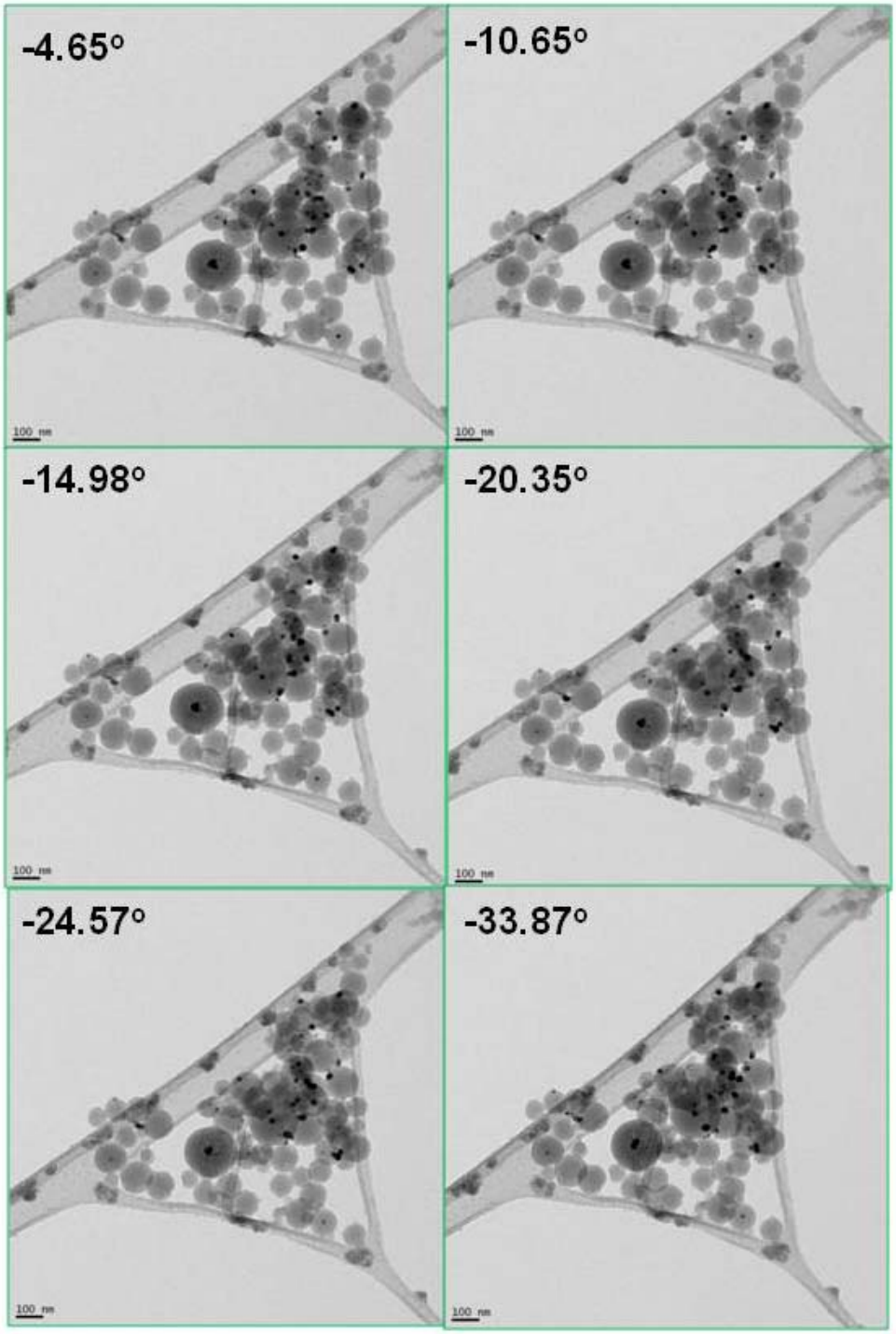

Figure S9. TEM images of carbon spheres with silver nanoparticles taken by varying the tilting angle.

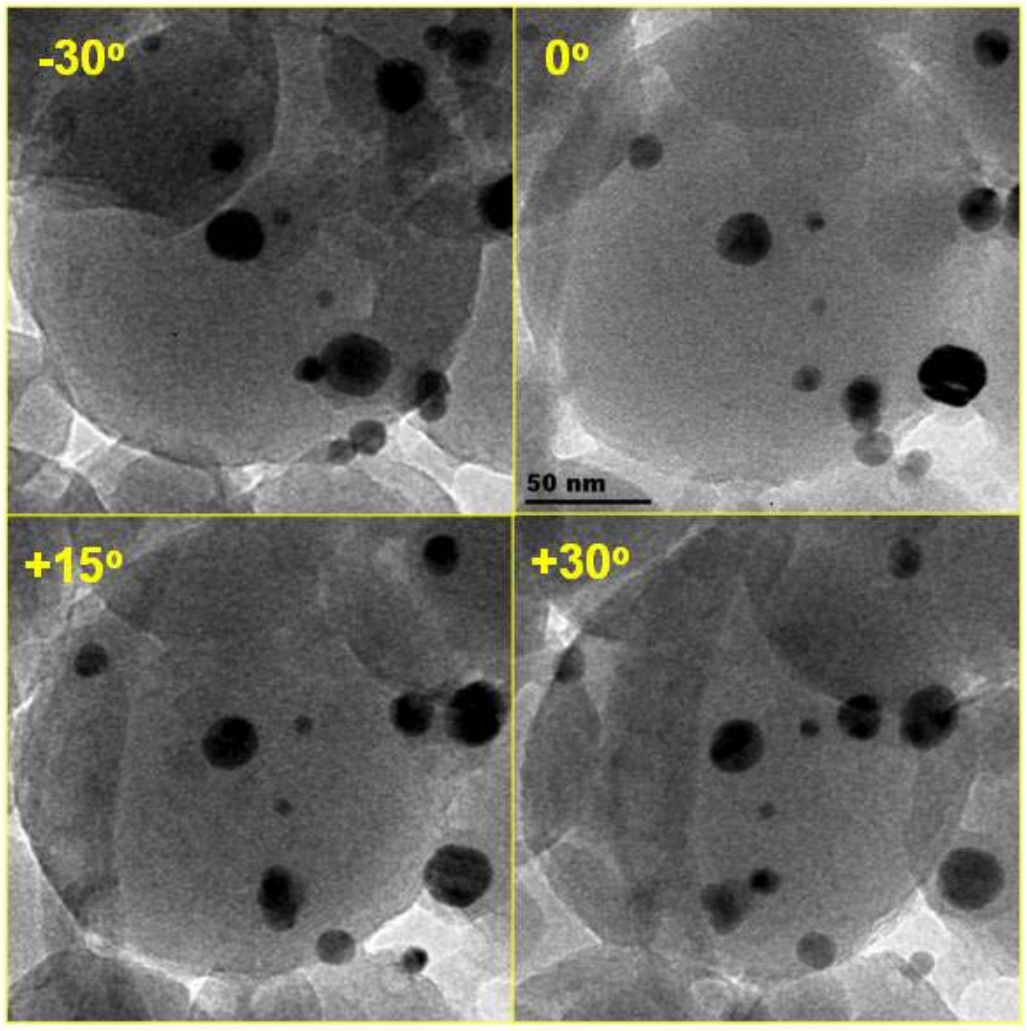

Figure S10. TEM images of the same single carbon sphere with silver nanoparticles taken by varying the tilting angle; note that the location of silver nanoparticle in the middle of carbon sphere did not change with tilting angle, while positions of other silver nanoparticles change on these images. The 50 nm scale bar is the same for all images.

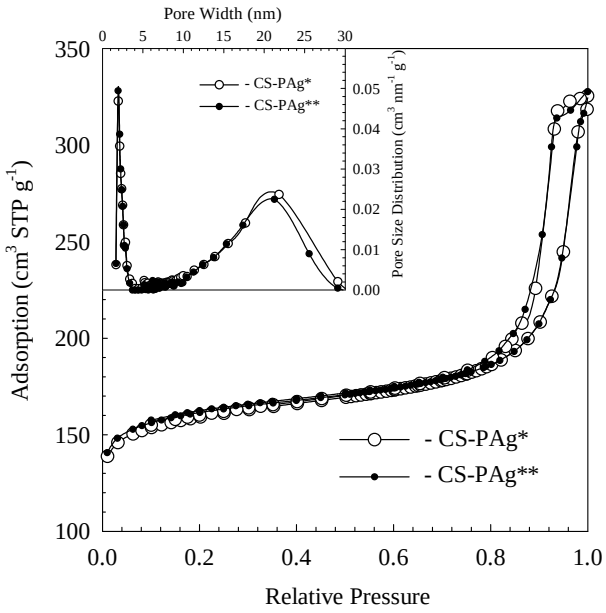

Figure S11. Nitrogen adsorption isotherms for two samples of carbon spheres prepared in the presence of silver nitrate under the same conditions; inset shows the corresponding pore size distributions.

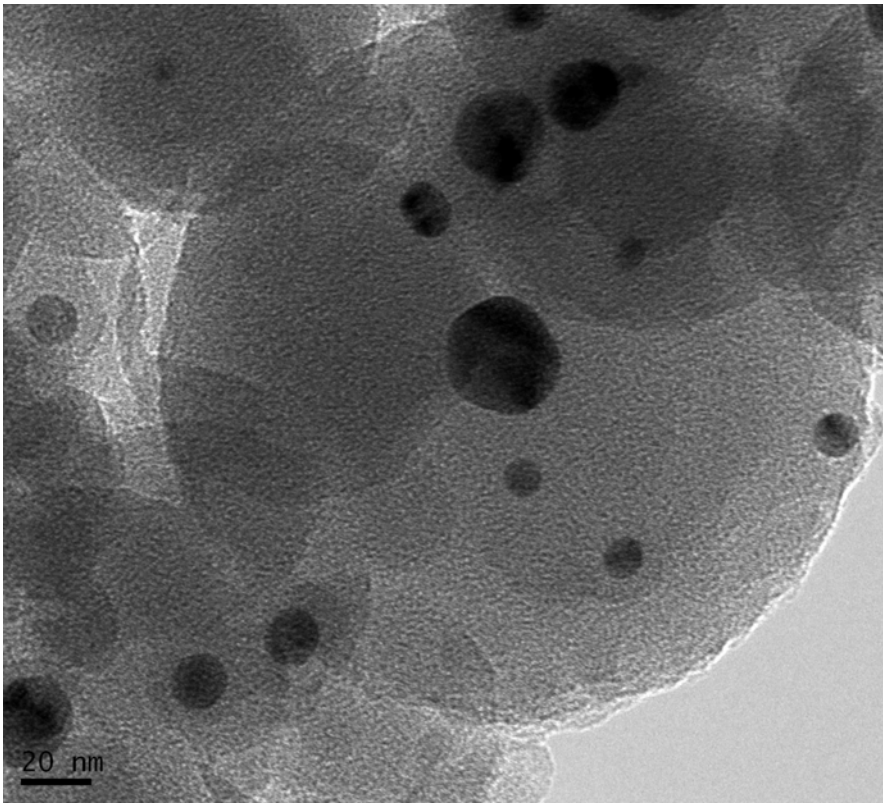

Figure S12. An enlarged picture of Figure 7c in order to better show the presence of micropores in carbon spheres.

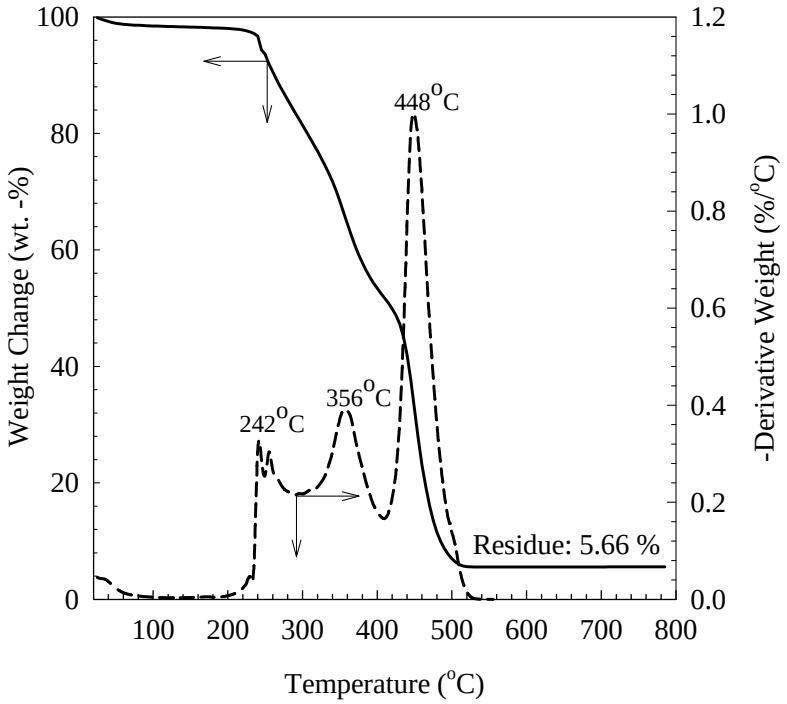

Figure S13. Thermogravimetric weight change profile and the corresponding DTG curve for mesoporous carbon spheres synthesized in the presence of block copolymer and silver nitrate (CS-PAg*) recorded in flowing air.