

# High bright Ag-carbon dots-silica hybrid mesoporous nanosphere

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## Abstract

Ag-enhanced fluorescent carbon dots-silica hybrid mesoporous spheres (Ag-CDSiMs) with a large surface area ( $>300\text{m}^2/\text{g}$ ) have been prepared through a facile method with silane-functionalized carbon dots (Si-CDs) [1, 2].

Comparing with fluorescent dyes, II-VI and III-V semiconductor quantum dots, carbon-related quantum dots (CQDs) have exhibited well chemical and photo-stability, non-toxicity and non-blinking nature [3-5]. Herein, we used environmentally-friendly silane functionalized CDs as luminescent species to fabricate metal enhanced luminescent mesoporous silica. It is worth noting that through the as-invented one-step method, the formation of metal NPs and mesoporous structured silica, and the immobilization of luminescent CQDs is finished simultaneously. For the decoration of silver Nanoparticles, the fluorescent intensity of CDs hybrid mesoporous silica enhanced nearly 3.5-times. With the help of the covalent link of CDs and mesoporous silica host, the fluorescent species was effectively anchored into mesoporous nanosphere, even in an organic solvent or very acidic medium. This work provides a new strategy and thinking for the fabrication of super bright mesoporous silica, as well as the interaction of metal and luminescent species.

## References

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