ATOMIC QUANTUM CLUSTERS AS CATALYST OF ANTIRRADICAL REACTIONS

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The study of antirradical agents has being attracting great attention in the last years because free radicals are responsible of several serious diseases such as cancer growing, cataract, diabetes mellitus, rheumatoid arthritis and cardiovascular diseases. Besides, they are involved in polymer degradation with enormous practical consequences like the well-known autooxidation of hydrocarbons, considered in the case of feed lipid components as the major cause of reduction in feed quality, and also the reason of the inexorable deterioration of polymeric materials.
The 2,2-diphenyl-1-picrylhydrazyl (DPPH) is a stable radical widely studied in this kind of investigations because its easy characterization by UV-Visible spectroscopy and its high stability as a solid and in solution.
Atomic quantum clusters (AQCs) are new materials whose size is less than ≈ 1 nanometer. They have a molecular-type structure, being a bridge between atoms and nanoparticles. These new materials show novel and unexpected properties, completely different to those displayed by the bulk metal or in nanoparticles, such as catalysis, photoluminescence, biocompatibility…
In this short talk we show for the first time AQCs, and more specifically silver 5 atoms clusters, acting as catalytic radical scavengers against the radical model DPPH.

REFERENCES

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FIGURES

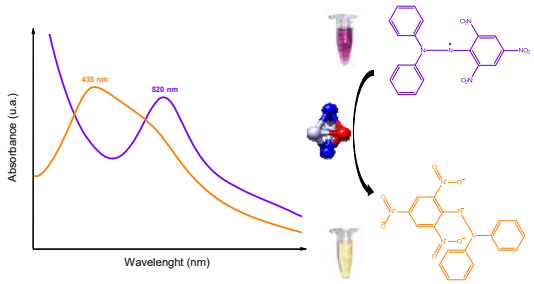

Figure 1: Reaction scheme and UV-Visible spectrum of the reduction of DPPH catalysed by Ag_5-AQCs.

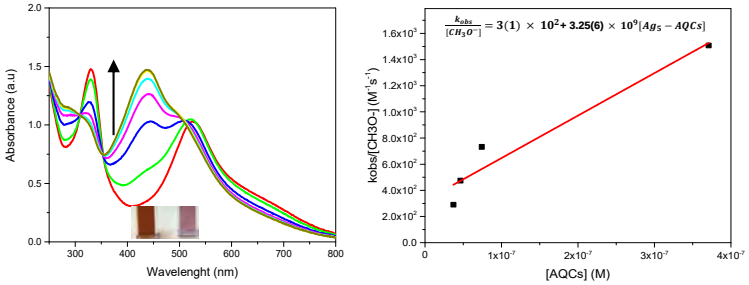

Figure 2: Changes with time in the UV-vis spectra of DPPH 1.125×10^{-4} M in the presence of 200 μg/L (≈3.7×10^{-7}M) Ag_5-AQCs in methanol and the representation of the kinetic constant versus Ag_5-AQCs concentration.