

Microwave assisted synthesis of silver nanoparticles, new polyoxometalates and their composites

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Polyoxometalates (POM) form a unique field of research at the edge of inorganic, coordination and supramolecular chemistry. The main feature of this class of compounds is structural versatility producing an infinite possibilities for the synthesis and modification. This aspect gives an opportunities to tune the structure in order to get an applications in catalysis, material science, biology or spintronics. Among metal nanoparticles, silver nanoparticles (Ag-NP) occupy a special place due to their unique physical and chemical properties. A lot of examples to utilize silver nanoparticles are known and the most important are molecular diagnostics (SERS) and photonic devices, which take an advantage for optical properties of such nanomaterials. Hence, the synthesis of stable colloids of silver NPs of a certain size is an important task of the modern chemistry. One of the most interesting goal to combine the above-mentioned fields is preparation of new catalytic systems using plasmonic effects for catalytic organic substrates transformation. In this work we use microwave assisted synthesis for: i) silver nanoparticles preparation; ii) polyoxovanadates synthesis tuning; iii) preparation of new composite materials based on Ag-NP and POM combination.

Acknowledgements—This work was supported by RSF (grant No. 19-73-10027).