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Review on the dissertation abstract of O.S. Kulakovich

"Metal and Hybrid Metal-Organic Plasmonic Nanostructures, their Properties and Application"

for the degree of Doctor of Chemical Sciences (02.00.11 Colloid Chemistry)

Scientific publications and doctoral dissertation topic of Dr. O.S. Kulakovich are related to the chemistry of nanostructured materials for molecular spectroscopy and photonics. A deep understanding of the physico-chemical and optical processes occurring in complex structures containing semiconductor nanocrystals, metal particles and polymers simultaneously is important for the practical application of such structures in sensors and optoelectronics.

Dr. O.S. Kulakovich developed new methods for producing hybrid organo-inorganic nanostructures containing colloidal particles of gold, silver and polymers to increase the sensitivity of molecular spectroscopy methods (Raman scattering and luminescence). She also identified factors that increase the photostability of quantum dots and enhance the Raman scattering and photoluminescence of molecules, nanocrystals, and microcrystals within the hybrid structures (including the chemical composition of the colloidal metal particles, dispersion medium, and ligand shell; the spatial arrangement of the hybrid structure components; the refractive index and chemical composition of the dielectric layer). This contributes to the development of the practical application of hybrid nanostructures to detect oxidizing agents, pesticides, antibodies, pigments through Surface-enhanced Raman scattering and luminescence methods as well as to development of new light-emitting materials and devices based on quantum dots.

Dr. O.S. Kulakovich was and is currently the head of several contracts with Scientific Institutes in China. We have been collaborating with her for several years on joint projects to develop new quantum dot-based materials for photonics and photovoltaics. Consider Dr. O.S. Kulakovich a recognized expert in colloidal chemistry of metal nanoparticles and semiconductor nanocrystals, I suppose she deserves to be awarded a Doctor of Chemical Sciences degree.

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