The superficial plasmonic resonances presented by the metallic gold and silver nanoparticles depend on the dimensions and shape of the nanoparticles as well as on the type of medium that surrounds them. A study of the enhanced surface Raman scattering activity (SERS) of hot spots formed between a silver nanocube and gold nanostars in a polymeric matrix is performed. In this work was performed the synthesis of gold nanoparticles by bioreduction star shapes were obtained and for the silver cubes a synthesis of the polyol was performed, these were deposited on a polystyrene matrix to be able to evaluate the signal intensity in the SERS effect. The characterization of the nanoparticles was carried out by transmission electron microscopy and visible UV spectroscopy. By modifying the surface of the polystyrene matrix and the amount of nanoparticles deposited on this substrate, a signal amplitude of up to 43 U.A. in Raman spectroscopy. The results show that the formation of hot spots is determined by the shape and size of the nanoparticles and depending on the rough surface of the polymeric matrix they will have a better accommodation for the generation of hot spots.

**Keywords:** SERS effect, nanoparticles, polymeric matrix

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