**Y**$^{3+}$ embedded in polymeric nanoparticles: morphology, dimension and stability of colloidal system

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Radiolabeled nanoparticles are promising tools in cancer diagnosis and therapy[1]. Moreover, yttrium-90 ($^{90}$Y) is a good candidate as suitable β - emitting radioisotope for a new approach to radio-guided surgery (RGS) proposed by some researchers of our group[2]. In this work, we developed new composite nanoparticles, based on polymethylmethacrylate (PMMA), and poly(methylmethacrylate-co-acrylic acid), P(MMA-AA), embedded with yttrium ion ($^{89}$Y$^{3+}$), as a first step for the development of $^{90}$Y$^{3+}$ based nanocomposites. The composite nanoparticles were synthesized by emulsion polymerization technique in the presence of KPS as radical initiator, using different MMA/AA molar ratio in the range 1-20%, and different MMA/Y$^{3+}$ molar ratios, in the range 1-20%. Yttrium doped polymeric nanoparticles were characterized by means of FTIR spectroscopy, DLS and Z-potential measurements and SEM-EDX technique[3,4,5]. The Y$^{3+}$ influence on morphology and dimension of composite nanoparticles was investigated, and monodispersed nanospheres with diameters above 80-150 nm were obtained. The composite material was studied by means of DLS and Z-potential technique and the colloids stability in water solution during 2 weeks, at different temperature (25°C and 37°C), were confirmed. Polymeric nanoparticles (diameter above 130 nm) embedded with $^{89}$Y$^{3+}$.

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