

## Preparation and Quality Control of a New Radiolabelled Complex of Spion

**Authors :** H. Yousefnia, SJ. Ahmadi, S. Sajadi, S. Zolghadri, A. Bahrami-Samani, M. Bagherzadeh

**Abstract :** Nowadays, superparamagnetic iron oxide nanoparticles (SPIONs) as the multitask agents have showed advantageous characteristics. The aim of this study was the preparation and quality control of  $^{153}\text{Sm}$ -DTPA-DA-SPION complex. Samarium-153 was produced by neutron irradiation of the enriched  $^{152}\text{Sm}_2\text{O}_3$  in a research reactor for 5 d. For radiolabeling purposes, 8 mg of the ligand was added to the vial containing  $^{153}\text{SmCl}_3$  and the mixture was sonicated 30 min, while pH was adjusted to 7-8. The radiochemical purity of the complex was checked by the ITLC method using  $\text{NH}_4\text{OH}:\text{MeOH}:\text{H}_2\text{O}$  (0.2:2:4) as the mobile phase. This new radiolabeled complex was prepared with a radiochemical purity of higher than 98% in 30 min at the optimized condition. The complex was kept at room temperature and in human serum at  $37^\circ\text{C}$  for 48 h, showed no loss of  $^{153}\text{Sm}$  from the complex. Considering all of these features, this new radiolabeled complex can be considered as a good therapeutic agent; however, further studies on its biological behavior are still needed.

**Keywords :** iron nanoparticles, preparation, quality control,  $^{153}\text{Sm}$

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