

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}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 °C for 48 h, showed no loss of ^{153}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}Sm

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