



The Preparation of $^{99m}\text{Tc-MAG}_3$ radiotracer by Ultrasound

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Abstract : The main aim of this investigation was to prepare $^{99m}\text{Tc-MAG}_3$ samples under sonication. Then the radio complex samples were compared with the counterparts which prepared by boiling water bath as the standard method from the aspects of stability in normal saline, human serum, partition coefficient, protein bonding and finally the biodistribution in rat. The preparation of $^{99m}\text{Tc-MAG}_3$ samples was examined to determine the ideal condition under sonication that radio complex samples could be prepared with appropriate radiochemical purity. The stability of radiotracer samples was assessed in normal saline up to 24 h post preparation. The partition coefficient, protein bonding and stability in human serum were analyzed. Then the biodistribution of radiotracer samples were evaluated in rat. The Radio-HPLC and ITLC assays indicated that the $^{99m}\text{Tc-MAG}_3$ samples could be successfully prepared with suitable yields by sonication. The radiolabeling efficiency was above the 90% when the reaction was carried out at 60°C for 1 min. The radio complex samples showed good stability in normal saline and human serum. The partition coefficient and protein bonding were -2.4 ± 0.32 and 35.23 ± 1.15 respectively when the radiolabeling was performed by the standard method. These values were -2.51 ± 0.42 and 39.36 ± 1.7 when the radiolabeling was undertaken by sonication. The biodistribution of $^{99m}\text{Tc-MAG}_3$ samples in the rats demonstrated that the radiolabeling procedure could not lead to a significant difference in the biodistribution of samples. The new developed technique can be recommended as an alternative for boiling water bath method to prepare $^{99m}\text{Tc-MAG}_3$.

Keywords : Renal imaging, Sonication, $^{99m}\text{Tc-MAG}_3$, Ultrasound radiation.

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