

Preparation, radiochemical purity control and stability of ^{99m}Tc -mertiatide (Mag-3)

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Background: Scintigraphic image analysis of ^{99m}Tc -mertiatide (Mag-3, mercaptoacetyltriglycine) clearance provides the determination of the blood flow, the tubular transit time and the excretion as well from both kidneys. Radiopharmaceutical routine recommends a radiochemical purity control before administration of the product to a patient. The main objective of this study is to develop a Mag-3 labeling procedure that fits better than the previous one in our daily routine production of radiopharmaceuticals. **Methods:** Increasing proportions of ^{99m}Tc -Mag-3 were measured during the heating and cooling steps of the Mag-3 labeling procedure. HPLC analysis was used to confirm the results of a rapid radiochemical quality control assay on standard ITLC-SG paper. **Results:** The reconstitution time takes 20–25 minutes from the harvest of pertechnetate to a ready-for-use calibrated patient syringe. The HPLC profile of ^{99m}Tc -Mag-3 including its minor impurities remains unchanged for 24–48 hours after reconstitution. **Conclusions:** The application of a programmable Peltier-directed device for heating/cooling provides a better control of the temperature course. The procedure proposed fully meets the labeling criteria recommended by the supplier and can be performed with a minimum of attention within a time-span that we formerly needed for solely the radiochemical purity control assay. Moreover, ^{99m}Tc -Mag-3 prepared in this way seems to be considerably more stable than mentioned in the manufacturer's instructions.

Key words: renal scintigraphy, radiopharmaceutical, technetium-99m-Mag-3 stability, chromatography, radiochemical purity/quality control