The distribution of 21-fluoroprogesterone-\(^{18}\)F was studied in female mice at 0.5, 1, 2 and 3 hours after intravenous injection of 1 \(\mu\)g/head. The blood showed the highest concentration and uptake in bone increased gradually. The target organ, uterus contained lower concentration, 0.35\% dose/gm at 3 hrs. These results were regarded that the receptor site was filled with natural progesterone and that defluorination took place in vivo.

81mKr-Generator for Medical use: The Effect of Humidity on 81mKr Effusion Efficiency in Gaseous Delivery

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In the lung inhalation study using medical 81mKr-generator (Nihon Medi-Physics Co., Ltd.), marked depression of 81mKr effusion efficiency was observed when dry, unhumidified air was used as the effusion gas, and quick recovery of the efficiency was noted with the use of humidified air.

In order to evaluate the effect quantitatively, the equilibrium 81mKr activity concentration in the effluent was measured as a function of time using an experimental apparatus in which the effusion air can be selected instantaneously from both dry and humidified line under constant pressure and flow rate. The depression of the effusion efficiency was exponential vs. time and it could be expressed in the following equation:

\[
\text{dry (A2)}_t = \frac{31.98}{\alpha} \times e^{(-0.100-0.122a)t} \\
(0.5 \leq \alpha \leq 2.5)
\]

where dry (A2)\(_t\) is the 81mKr activity concentration (mCi/l) in the effluent from a generator (81Rb: 10mCi) at t min after the start of the effusion with dry air, and \(\alpha\) is the flow rate (l/min) of the dry air. Once the effusion gas was switched to the humidified air, the recovery of the efficiency was completed within 3 min at the flow rate of 0.5–2.5 l/min.

The ion exchange (Dowex 50wx8 100–200 mesh) contains about 45 weight \% water at humidified state. Dry air gradually removes a portion of this inner water (free water), and hence the contraction of the resin sphere would be caused. This contraction reduces the effective surface area, i.e. the surface that contacts with outer atmosphere, and depresses the diffusion of 81mKr which generated from 81Rb on the resin surface.

On the other hand, the surface of the resin maintains its original shape under a humidified atmosphere and 81mKr diffuses well into the effusion gas.

In summary, the humidification of the effusion gas is showed to be necessary from the two viewpoints: the protection of the subject’s throat and the prevention of the effusion efficiency depression.

A Chemically Characterized 99mTc-PG Preparation for Cholescintigraphy: a Kit Method

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99mTc-Pyridoxilidene glutamate introduced by Baker et al. is an interesting technetium labeled cholescintigraphic agent but its cumbersome method of preparation and the lack of reproducible singular compound severely limits its use in the clinic field.