exchange (Dowex-50Wx8, 100～200 mesh in a 1.5cmϕ×40cm column). The elusion was performed at room temperature with 700～1,000ml of 0.12 M α-hydroxy-isobutylic acid of pH 3.8 at a flow rate of 15ml/hr. Fractions with an appreciable tailing of Yb were combined and subjected to the cation-exchange once again.

About 500 μCi of a high specific activity ^{167}Tm were prepared from a 22 hr irradiation of a 40 mg $^{168}Yb_2O_3$ with a electron beam of 200 μA, and used for administration tests to Yoshida sarcoma-bearing rats and rats with fractured tibia (See A. Ando et al., Paper No. 137 of this Conference report).

Electrochemical Preparation of ^{99m}Tc-Phytate

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We reported the eletrolysis method for labeling several kinds of compounds with ^{99m}Tc previously. As the results of further investigation, we found that there are some compounds such as penicillamin and phytic acid which can be easily labeled with ^{99m}Tc electrochemically.

The basic principle of electrochemical method is similar to that of electrolysis method on the reduction of $^{99m}TcO_4^-$ with stannous ion dissolved from the tin anode.

Pt-Sn plate was used for labeling, and stannous ion is released from tin plate by ionization tendency in electrolytic solution.

^{99m}Tc was readily incorporated into phytic acid by this electrochemical method. Labeling efficiency of ^{99m}Tc-phytate averaged more than 95% under optimal condition. The reaction of ^{99m}Tc and phytic acid depends upon the pH of solution because the anodic reaction of tin in corrosion greatly depend upon the pH of solution. The most suitable pH range for labeling is below 6 and ^{99m}Tc-phytate thus obtained precipitated with Ca^{2+} in pH above 4.

Though ^{99m}Tc-phytate is soluble in aqueous solution, it is accumulated into RES system by forming insoluble particles with Ca^{2+} in vivo. More than 90% of ^{99m}Tc-phytate was accumulated into liver in mice, and its biological half life in the liver was about 112 hr.

The stability of ^{99m}Tc-phytate was affected by various conditions. Though Pt-Sn plate stabilized the ^{99m}Tc-phytate solution, free $^{99m}TcO_4^-$ increased by removing the Pt-Sn plate from the solution. $^{99m}TcO_4^-$ was also released by increacing the temperature.

In respect that the electrochemical method does not need electricity and treatment of reductant, this might be one of the most convenient method for labeling of compounds with ^{99m}Tc.