Photorecording of Gamma Image Using Beta-ray of ^{90}Sr-^{90}Y and Its Application for Traverse Scanning

H. SAITO and T. MIURA
Department of Radiology, Nagoya University School of Medicine, Nagoya

Since the exposure of ^{90}Sr-^{90}Y beta-ray caused the blackening of X-ray film in the paper bag, a 5 mCi ^{90}Sr-^{90}Y beta-ray source was placed in a $3\times3\times5$ cm^3 2 mm thick lead box with a 0.3×0.4 cm^2 hole at the bottom and a lead shutter over the hole. To increase contrast and intensity, two image intensifying screens (Kyokko HS) were used on the both sides of X-ray film. The shutter was controlled with a magnet, which responded to the impulses arriving from ordinary scintillation scanner. Moving on the paper bag of X-ray film, the information from the detector of the scanner was recorded on the film by the exposure to beta-ray. Thus the light tight box and photorecording equipments were not needed. The response of the lead shutter to impulse was rapid and the contrast of gamma images of scanned tissues was an good as that of ordinary photoscintigram. The above device may be called "beta-ray recorder" and the results "beta-photoscintigram". The above mentioned beta-ray recorder was modified for the recording of traverse scan image; a 35×0.3 cm^2 slit instead of a 0.3×0.4 cm^2 hole, and a meta-acrylate wedge absorber of beta-ray instead of a 2 mm lead shutter. The wedge controlling exposure moved in response to count rate at a scanning. When the horizontally faced head of the detector with 20 cm focusing honey cone collimator moved back and forth, receiving impulse from a section of the body, the subject and film were turned 5 degree on the synchronized turntables.

The scintigram thus obtained was sufficiently clear and the size of the object was shown in fair agreement, however the distortion of image was observed, when the absorption of gamma-ray by the tissue near the radioactive object was very large.

This beta-ray recorder does not require such an expensive system for traverse scanning as Kuhl's did.

Preparation of ^{99m}Tc Compounds

S. KATO, K. KURATA, T. WAKEBAYASHI and Y. SUGISAWA
Dainabot Radioisotope Laboratory

^{99m}Tc has been used extensively for scintillation scanning in recent years because its physical and chemical characteristics are very suitable for the purpose. But the preparations of ^{99m}Tc compounds must be performed by users themselves within a limited time. For this reason it was necessary to have established the rapid and easy preparation methods of them. In this paper the preparation methods of the compounds by Larson, Nelp, etc. were discussed and the purity and toxity of them from pharmacologic point of view were described. The preparation of ^{99m}Tc-Fe complex was also investigated and the variations of distribution of ^{99m}Tc-Fe complex in various organs of a rabbit after intravenous injection were measured.

^{99m}Tc-S-colloid

The method of preparing ^{99m}Tc-S-colloid by Nelp. etc., in which $Na_2S_2O_3$ had been used instead of H_2S gas, was studied. The effects of varying concentration of $Na_2S_2O_3$ on the colloid formation were examined. It was confirmed by paperchromatogram that more than 99% of ^{99m}Tc activity reacted with sulphur to form ^{99m}Tc-S-colloid at the 0.02 M $Na_2S_2O_3$ concentration. Meanwhile it was