
[C-11]HCN is well known to be an important reagent for the synthesis of various [C-11] radiopharmaceuticals and several methods for its production have been reported. We have developed an automated on-line [C-11]HCN production system by use of [C-11]CO2 as a starting materials. In this method, we can produce [C-11]HCN continuously with another [C-11]compound without exchange of target.

The procedure of this method is as follows:
(2) Addition of excess NH3.
(3) Passing [C-11]CH, and NH3 through Pt catalyst at 890°C ([C-11]HCN formation).

This method is now widely used for practical production of [C-11]HCN, but its optimal condition have not been fully known.

By using this system, we investigated the effects of NH3 concentration, contact time with Pt catalyst, reaction temperature and presence of H2O on the yield of [C-11]HCN production. In results, under these optimal conditions (NH3:5%, flow rate: 200ml/min, an excess amount of Pt wire at about 920°C, using metallic sodium to minimize the presence of H2O), [C-11]HCN was obtained with a high radiochemical yield of 98%.

AUTOMATED SYNTHESIS OF 18F-5-FLUORO-2'-DEOXYURIDINE. M.Minna, K.Ishiwata, R.Iwata and T.Ido. Cyclotron and Radioisotope Center Tohoku University, Sendai.

18F-5-fluoro-2'-deoxyuridine (18FdUrd) can be used as a useful diagnostic agent for tumor detection, especially in the brain and lung, by positron emission tomography. Automated synthesis system has been developed for its routine medical use. 18FdUrd was synthesized by the method of Shiue et al with some modifications. The synthetic procedure used for the automation consists of the reaction of 18F with 3',5'-di-O-acetyl-2'-deoxyuridine, hydrolysis of the 18F-adduct and purification of 18FdUrd by column chromatography on ion exchange resin and alumina. The computer control system of fully automated synthesis of 18FDG was applied to the present system, and it automatically controls the whole procedure. The synthesis system was also designed to provide a sterile and pyrogen-free 18FdUrd solution without reducing convenience. Thus, the system allows to provide 20-30 mCi of 18FdUrd with radiochemical purity of over 99% within 60 min after the irradiation, and it had been applied to the production of 18F-5-fluouracil by the same program.

DEVELOPMENT OF AN AUTOMATIC 11C-RECOVERY-AND 18FDG-SYNTHESIS SYSTEM. Y.Adachi, Y.Nishihara,K.Hiroishi,H.Suzuki (Sumitomo Heavy Industries Ltd.), N.Sainya (Tokyo Nuclear Service Ltd.) and T.Irie (NIRS).

11C is an important precursor for the synthesis of 18FDG - a useful positron labeled compound - as well as other similar compounds. The authors have developed an automatic system for 11C recovery and 18FDG synthesis, as a part of "CYPRIS", which is a compact cyclotron for medical use.

In this system all processes from the production of 11C, in a target substance to the synthesis of 18FDG are controlled automatically by microcomputer realizing stable synthesis of 18FDG without radiation exposure risk to the operator. Both the conventional synthetic method and another method using 18F-acetylhypofluorite (CH3COO18F) as the precursor can be used in this system, and a comparison of the two methods is discussed here.