50

THE DEVELOPMENT OF THE APPARATUS FOR FULLY AUTOMATED SYNTHESIS OF [N-13]AMMONIA.
T.Ido and R.Iwata. National Institute of Radiological Sciences. Chiba.

A Fully automated apparatus for repeated production of [N-13]ammonia from proton bombardment of water has been developed. Its operation sequence consists of the introduction of NaOH, the bombarded water containing [N-13]nitrate and $TiCl_3$ into a reaction vessel, the distillation of [N-13]ammonia formed by reduction of [N-13]nitrate from the vessel into a vial, and the washing the vessel for the next sequence. The NaOH and $TiCl_3$ are added as 4 ml of saturated solution and 4 ml of 10 % aqueous solution, respectively, and halogen lamps are used as the heat source for the distillation. By this apparatus, [N-13]ammonia can be produced automatically and repeatedly in a radiochemical yield of 80 - 90 % within 10 min from the end of bombardment.

51

PHOTOSYNTHESIS OF C-11 LABELED GLUCOSE.
K.Imamura,T.Nozaki and M.Iio. St. Marianna University School of Medicine, Institute of Physics and Chemistry Research, and Nakano National Chest Hospital. Kawasaki, Wako and Tokyo.

Using spinach or spinach beet leaf(~0.5g) cyclotron-produced C-11 labeled glucose was prepared by photosynthesis. Commercially available spinach provided good and constant yield. C-11 CO_2 was concentrated through a molecular sieve. Light was irradiated for 10 to 20 minutes, followed by a hot ethanol (90%) extraction. Colored pigment was extracted to ether. Aqueous phase was concentrated in a microwave heater, and sugar was separated through an anion exchange column from charged components. Almost all of C-11 (99%) was attributed to glucose and fructose (1.1 : 1) after acid-hydrolysis. Chemical yield was 50～60%, and radiochemical yield was about 10%. Specific activity was about 40Ci/mM.

52

PRODUCTION OF [C-11]GUANIDINE, A NEW PRECURSOR FOR LABELING WITH C-11 AND ITS USE IN THE SYNTHESIS OF [C-11]PYRIMIDINES.
R.Iwata, T.Ido and T.Tomonaga. Natinal Institute of Radiological Sciences and Tokyo University. Chiba and Tokyo.

A new precursor, [C-11]guanidine, for the synthesis of [C-11]radiopharmaceuticals was produced by the proton irradiation of the liquid ammonia-nitrous oxide system. The optimal ratio of ammonia and nitrous oxide was obtained at a 5 μA-30 min irradiation. The maximum yield of [C-11]guanidine was about 42 % at 69 m mol of nitrous oxide per 200 m mol of liquid ammonia. The synthesis of 2-amino[2-C-11]pyrimidines was carried out by using [C-11]guanidine and the optimal reaction conditions were determined. The radiochemical yields of the three [C-11]-pyrimidines were about 70 - 100 %. It was shown that trimethinium salts are suitable for the synthesis of [C-11]pyrimidines from [C-11]guanidine.

53

NEW METHODS FOR THE MEASUREMENT OF BLOOD FLOW USING THE RATIO OF PARENT AND DAUGHTER NUCLIDE.
H.Mori,R.Amano,S.Sanada,T.Hiraki and K.Hisada. Radioisotope Center, School of Paramedicine and Department of Nuclear Medicine, Kanazawa University. Kanazawa.

Because of different chemical and physical properties, the measurement of the ratio of parent and daughter nuclide could provide noninvasive procedure enabling serial measurements to be made following a single administration. Then, using Rb-81-Kr-81m generator and a gamma camera, the dynamic phantom and animal studies were performed and showed a good correlation with calibrated flow. Although this method has several problems to be solved for the practical application, this study suggests that specific flow can be measured in vivo with the gamma camera after the injection of parent nuclide.