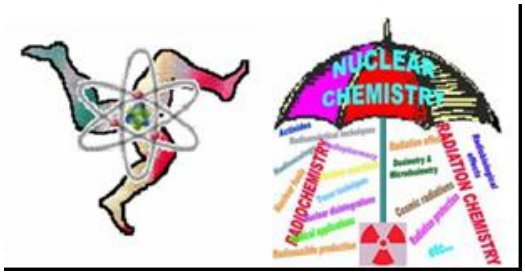

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Attempts to develop new synthesizing methods of 2-fluoro-2-deoxy-d-glucose radiolabelled with fluorine-18 (18F-FDG)

Tuesday, 20 September 2011 12:15 (15 minutes)

2-Fluoro-2-deoxy-D-glucose radiolabeled with Fluorine-18 (18F-FDG) is routinely used in nuclear medicine as a PET imaging radiopharmaceutical and nucleophilicly synthesised, in general, using mannose triflate as a precursor in the presence of Kryptofix 222TM as a catalyst in acetonitrile as a polar aprotic solvent, which involves the SN2 nucleophilic substitution reaction of 18F to 2-position of mannose triflate. The excess of 18F in the reaction medium has been removed by the use of a quaternary ammonium anion exchange Sep-Pak column, known QMA (QMA Sep-PakTM). This reaction process has been applied in routine 18F-FDG synthesis, using fully automatic commercial synthesizing modules. The total synthesizing time of 18F-FDG, using this procedure, requires about 30 - 45 min, which means that an important 18F activity, produced by cyclotron, is lost at the end of this synthesizing procedure. Of course, this raises the cost of 18F-FDG used for PET imaging. In this study, we have tried to develop two different easier and quicker ways for 18F-FDG synthesis, which will be able to be used in routine applications. The first is the isotopic exchange reaction between 18F ion and 19F of 2-fluoro-2-deoxy-D-glucose molecule was realised in water, at 95 °C, for about 10 min. The second is Selectfluor TM, first tried to be labeled with 18F, then it was used to label 2-deoxy-D-glucose. In both cases, high radiolabeling yields were obtained.

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