HPLC/MS ANALYSIS OF GLUCOSE AND FLUORODEOXYGLUCOSE

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Labeled 18fluoro-deoxyglucose, 2-[^{18}F]FDG, obtained by the modification of the synthesis described by HAMACHER, NEBELING and BLESSING, [*Appl. Radiat. Isot.*, 41, 49 (1990)] is purified by successive column technique using the anion exchange resin, silica-C18 and alumina cartridges. A quality control can be performed via Radio-HPLC and gas chromtaography in 10 minutes [HAMACHER, COENEN and STÖCKLIN, *J. Nucl. Med.* 27, 235 (1986)]. The specific activity is better than 10 Ci/μmol (370 GBq/μmol); the radiochemical purity is about 98,5 %. FRANSSEN, LUURTSEMA, MEDEMA, VISSER, VAALBURG, JERONISMUS-SHALINGH, and BRUINS presented liquid chromatography combined with mass-spectrometry (LC-MS) as a new quality control tool for PET-radiopharmaceuticals [*Appl.Rad.Isotopes* 45, 937 (1994)].

Objective of a new method of FDG analysis development is to replace existing tests by a more complex assay. In this work, a liquid chromatography/refractive index detector/ radiometric detector/mass spectrometric detector combination (HPLC/RID/RAD/MSD) was used for development of a complex routine technique. Optimization of HPLC/MS analysis was performed investigating the MSD analytical signal as a function of various eluent composition.

Solutions of glucose in metanol/water and acetonitrile/water solutions of various semi-volatile electrolytes (ammonium chloride, formic acid, ammonium formate) were analyzed on the Agilent 1100 HPLC/RID/DAD/MSD system either in the flow injection (FIA) mode of analysis, and after passing the samples through Zorbax C-18 column.

The most intensive signals were obtained from the complex ions:
positive ions: gluNa$^+$, 203
negative ions: gluCl$^-$, 215
The most intensive signals of the ions were obtained in the acetonitrile : 0.25% ammonium formate = 80:20 solutions. This eluent would be also used for the radioactive FDG analysis on the Asahipak NH2P columns [*http://www.hplc.com/Shodex/ english/dc030101.htm*].

Acknowledgement. Analysis were performed on an HPLC-[DAD-RID-RAD]-MSD equipment supplied by the International Atomic Energy Agency within a grant of the Technical Co-operation Project SLR/2/002


SK01K0206