Research Article

Journal of Labelled Compounds and Radiopharmaceuticals

Received 2 July 2010, Revised 12 August 2010, Accepted 3 September 2010 Published online in Wiley Online Library

(wileyonlinelibrary.com) DOI: 10.1002/jlcr.1838

[*N*-Methyl-^{11}C]choline by on-column reaction: a study on [^{11}C]CH_3I incorporation and the residual amount of precursor in the product

A. Bogni,[a] O. Crispu,[a] L. Fugazza,[b] C. Cucchi,[a] L. Laera,[a] R. Iwata,[c] F. Crippa,[a] E. Bombardieri,[a] and C. Pascali[a]*

[*N*-Methyl-^{11}C]choline has been synthesized at room temperature by the reaction of [^{11}C]CH_3I with 2-dimethylaminoethanol (DMAE), with the latter directly loaded on a weak cation-exchange cartridge. Most of the efforts have been directed to reduce the amount of residual precursor in the product's final solution in order to make this tracer more suitable to brain studies. In the process, radiochemical yields and residual DMAE have been placed in relation with both the starting amount of precursor and the rinsing conditions used and compared with the more 'traditional' loading of the precursor on either a C18 cartridge or a loop. Comments and indications on the most convenient analytical technique and conditions for quantitative analysis, with particular emphasis on the precursor, are also reported. Under what we believe to be a fair compromise, [^{11}C]CH_3I incorporation yields of ca. 90% were easily achieved with a residual amount of starting material in the 8- to 12-ppm range.

Keywords: quality control; 2-dimethylamino ethanol; choline; on-column