

Chromatography Study of Fundamental Properties of Medical Radioisotope Astatine-211

Authors : Evgeny E. Tereshatov

Abstract : Astatine-211 is considered one of the most promising radionuclides for Targeted Alpha Therapy. In order to develop reliable procedures to label biomolecules and utilize efficient delivery vehicle principles, one should understand the main chemical characteristics of astatine. The short half-life of ^{211}At (~7.2 h) and absence of any stable isotopes of this element are limiting factors towards studying the behavior of astatine. Our team has developed a procedure for rapid and efficient isolation of astatine from irradiated bismuth material in nitric acid media based on 3-octanone and 1-octanol extraction chromatography resins. This process has been automated and it takes 20 min from the beginning of the target dissolution to the At-211 fraction elution. Our next step is to consider commercially available chromatography resins and their applicability in astatine purification in the same media. Results obtained along with the corresponding sorption mechanisms will be discussed.

Keywords : astatine-211, chromatography, automation, mechanism, radiopharmaceuticals

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