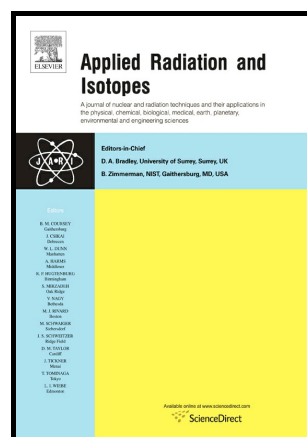


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An automated flow system incorporating in-line acid dissolution of bismuth metal from a cyclotron irradiated target assembly for use in the isolation of astatine-211

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ABSTRACT

Astatine-211 (²¹¹At) is a promising cyclotron-produced radionuclide being investigated for use in targeted alpha therapy. The wet chemical isolation of trace quantities of ²¹¹At, produced within several grams of Bi metal deposited onto an aluminum cyclotron target assembly, involves a multi-step procedure. Because the ²¹¹At isolation method is labor-intensive and complex, automation of the method is being developed to facilitate routine processing at the University of Washington and to make it easier to transfer the process to other institutions. As part of that automation effort, a module useful in the initial step of the isolation procedure, dissolution of the Bi target, was designed and tested. The computer-controlled module performs in-line dissolution of Bi metal from the target assembly using an enclosed target dissolution block, routing the resulting solubilized ²¹¹At/Bi mixture to the subsequent process step. The

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