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Bray et al.

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[54] **BISMUTH GENERATOR METHOD**

[57] **ABSTRACT**

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A method for separating ²¹³Bi from a solution of radionuclides wherein the solution contains a concentration of the chloride ions and hydrogen ions adjusted to allow the formation of a chloride complex. The solution is then brought into contact with an anion exchange resin, whereupon ²¹³Bi is absorbed from the solution and adhered onto the anion exchange resin in the chloride complex. Other non-absorbing radionuclides such as ²²⁵Ra, ²²⁵Ac, and ²²¹Fr, along with HCl are removed from the anion exchange resin with a scrub solution. The ²¹³Bi is removed from the anion exchange resin by washing the anion exchange resin with a stripping solution free of chloride ions and with a reduced hydrogen ion concentration which breaks the chloride anionic complex, releasing the ²¹³Bi as a cation. In a preferred embodiment of the present invention, the anion exchange resin is provided as a thin membrane, allowing for extremely rapid adherence and stripping of the ²¹³Bi. A preferred stripping solution for purification of ²¹³Bi for use in medical applications includes sodium acetate, pH 5.5. A protein conjugated with bifunctional chelating agents in vivo with the NaOAc. to receive the ²¹³Bi as it is being released from the anion exchange resin.

[73] Assignee: **Battelle Memorial Institute**, Richland, Wash.

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[51] Int. Cl.⁶ **C01G 30/00**

[52] U.S. Cl. **423/2; 423/249; 376/189; 210/682; 210/684**

[58] Field of Search **423/2, 249; 210/682, 210/683, 684; 316/189**

[56] **References Cited**

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7 Claims, 2 Drawing Sheets