

RADIONUCLIDIC GENERATORS OF CURRENT INTEREST – DEVELOPMENTS AND FUTURE TRENDS

Vučina J¹, Lukić D¹, Nikolić N¹, Orlić M¹, Han R²

¹Vinča Institute of Nuclear Sciences, Laboratory for Radioisotopes, Belgrade, Serbia and Montenegro,

²Clinical Centre of Serbia, Institute of Nuclear Medicine, Belgrade, Serbia & Montenegro

Radionuclidic generators for the production of short-lived radioisotopes continue to play an important role both in the diagnostic and therapeutic nuclear medicine. In diagnostics ^{99m}Tc is still dominant. The main source for its production are the chromatographic ⁹⁹Mo/^{99m}Tc generators based on fission-produced (FP) ⁹⁹Mo adsorbed on alumina. The elution of ^{99m}Tc is performed by using saline solution. However, there are regions which, due to economic or geographical reasons do not have the access to FP ⁹⁹Mo. To meet their requirements two approaches are considered. The first is the development of gel type generators. The alternative is the post concentration of low specific volume solutions of ^{99m}Tc obtained by the elution of chromatographic alumina generators loaded with low specific activity ⁹⁹Mo. In this case ⁹⁹Mo is obtained by (n,γ) nuclear reaction. The paper brings the details of the principles involved. In short, they are mainly based on cation/anion exchange. In therapy the increasing applications and demand require the increasing access to generator-derived beta and alpha emitting radioisotopes. Currently ⁹⁰Y, ¹⁸⁸Re and ²¹³Bi are of major interest. The corresponding generators are: ⁹⁰Sr/⁹⁰Y, ¹⁸⁸W/¹⁸⁸Re and ²²⁵Ac/²¹³Bi. The main fields of applications are oncology, bone pain palliation and synovectomy. The paper is focussed on the discussion of the main parameters of these as well as some other generators. The fields of application are also revealed.