

Production of radionuclide ^{90}Mo using thermochromatography

In recent years intensive research has been carried out to expand the database of the available (expedient) radionuclides for immune –PET scanning. Selection criteria are a high relative yield of positron emission, appropriate positron energy, suitable lifetime, suitable chemical properties, low toxicity and minimal radiation dose in body from accompanying nuclear γ –radiation decay.

Currently ^{64}Cu , ^{86}Y , ^{76}Br , ^{89}Zr , ^{124}I are the most widely used radionuclides in immune - PET diagnostics. Niobium-90 has potential to become one of them because of its favorable characteristics: lifetime of 14.6 hours, relative β^+ yield of 53%, average β^+ energy of 0.35 MeV, V valent bond to a ligand is sufficiently stable. Therefore, it is of great importance to develop methods for its production in no-carrier-added form.

In this work we developed an alternative technique for ^{90}Mo production by thermochromatography. ^{90}Mo is used as a source (a parent radionuclide) for making a ^{90}Mo - ^{90}Nb generator. ^{93}Nb (p, 4n) ^{90}Mo (β^+ $T_{1/2} = 5.7$ h) \rightarrow ^{90}Nb ($T_{1/2} = 14.6$ h).

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