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Production of radionuclide 90Mo 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 64Cu, 86Y, 76Br, 89Zr, 124I 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 90Mo production by thermochromatography. 90Mo is used as a source (a parent radionuclide) for making a 90Mo-90Nb generator. 93Nb (p, 4n) 90Mo (β+ T1/2 = 5.7 h)⟶90Nb(T1/2 = 14.6 h).

Primary author: Mr CHUPRAKOV, Ilya (Joint Institute for Nuclear Research (Dubna);The Institute of Nuclear Physics (Almaty)

Presenter: Mr CHUPRAKOV, Ilya (Joint Institute for Nuclear Research (Dubna);The Institute of Nuclear Physics (Almaty)

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