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Comparison of eight possible ^{99}Mo -molybdenum production routes

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The present paper addresses eight possible routes of producing ^{99}Mo , and discusses both yield and ^{99}Mo specific activities (SA) in the context of future anticipated worldwide demand. The dimensions of the targets are modelled by considering both the limits set by cooling and those by inside-target radiation attenuation characteristics. Energy deposition profiles are modelled by MCNP6, the reaction probabilities are taken from TALYS/TENDL and JANIS codes, and both are used in calculating produced ^{99}Mo .

The results suggest that U neutron-fission may remain one of the most relevant and efficient means of producing ^{99}Mo , but that new developments may surface, such as ADSR or AHR production modes. Accelerator-based ^{99}Mo production is discussed as asking for developments in both the cooling of targets and new concepts in post-EOB upgrading of ^{99}Mo SA, and/or new concepts for $^{99}\text{Mo}/^{99\text{m}}\text{Tc}$ -generators, the latter possibly in both volumes (mass) and ^{99}Mo capacities.

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