The Use of Thermal Neutron Fission for Isotope Enrichment

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HOUGH — The world has many applications for elements enriched in a particu-
lar isotope. These find application in medicine, nanostructures, electronics, process
control and all forms of research. Some degree of enrichment compared to that pro-
vided by natural abundance is supplied by fission products produced by the various
forms of fissile and fertile materials. Examples are given of U-235 thermal neutron
fission. The most used medical isotope is Tc-99m, produced by Mo-99 beta decay;
Mo has seven stable isotopes. In the fission product distribution Mo-92 and Mo-94
are absent and the grandparent of Mo-96 has a half-life of $10^{19}$ years. These three
isotopes represent 41% of natural Mo; consequently the remaining Mo isotopes pro-
duced in fission are considerably enriched. This would provide good feed material
for further enrichment by any applicable enrichment technique.