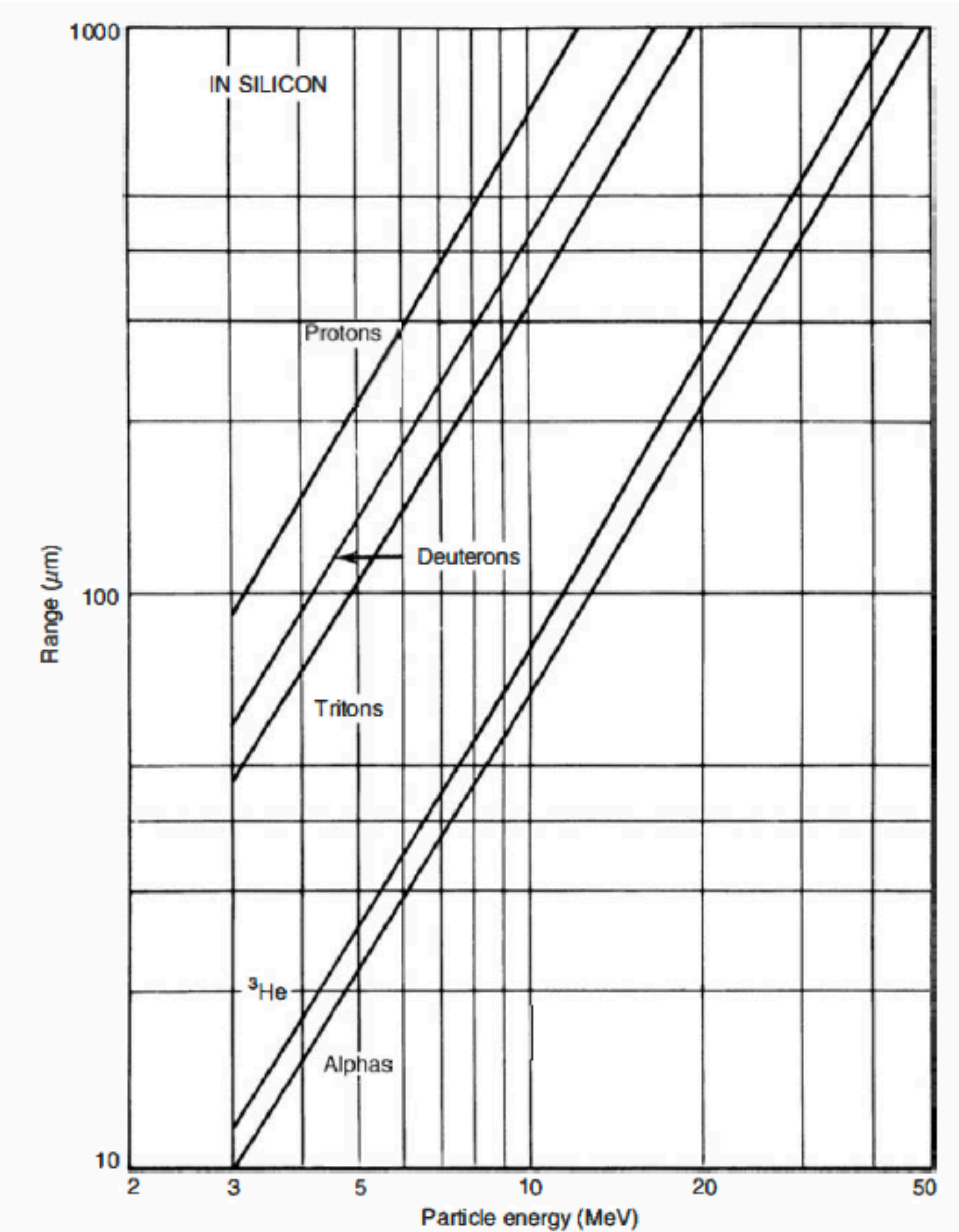
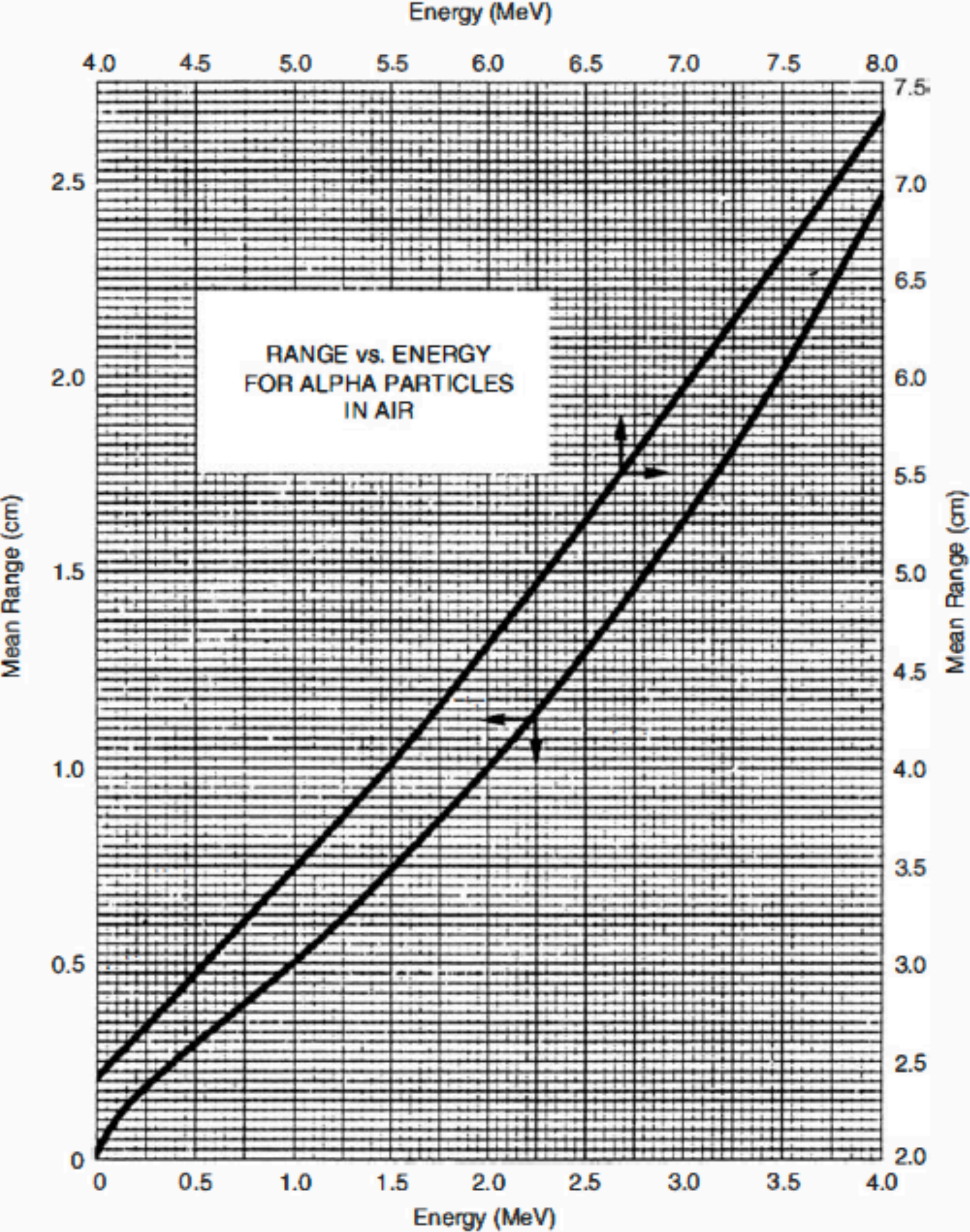
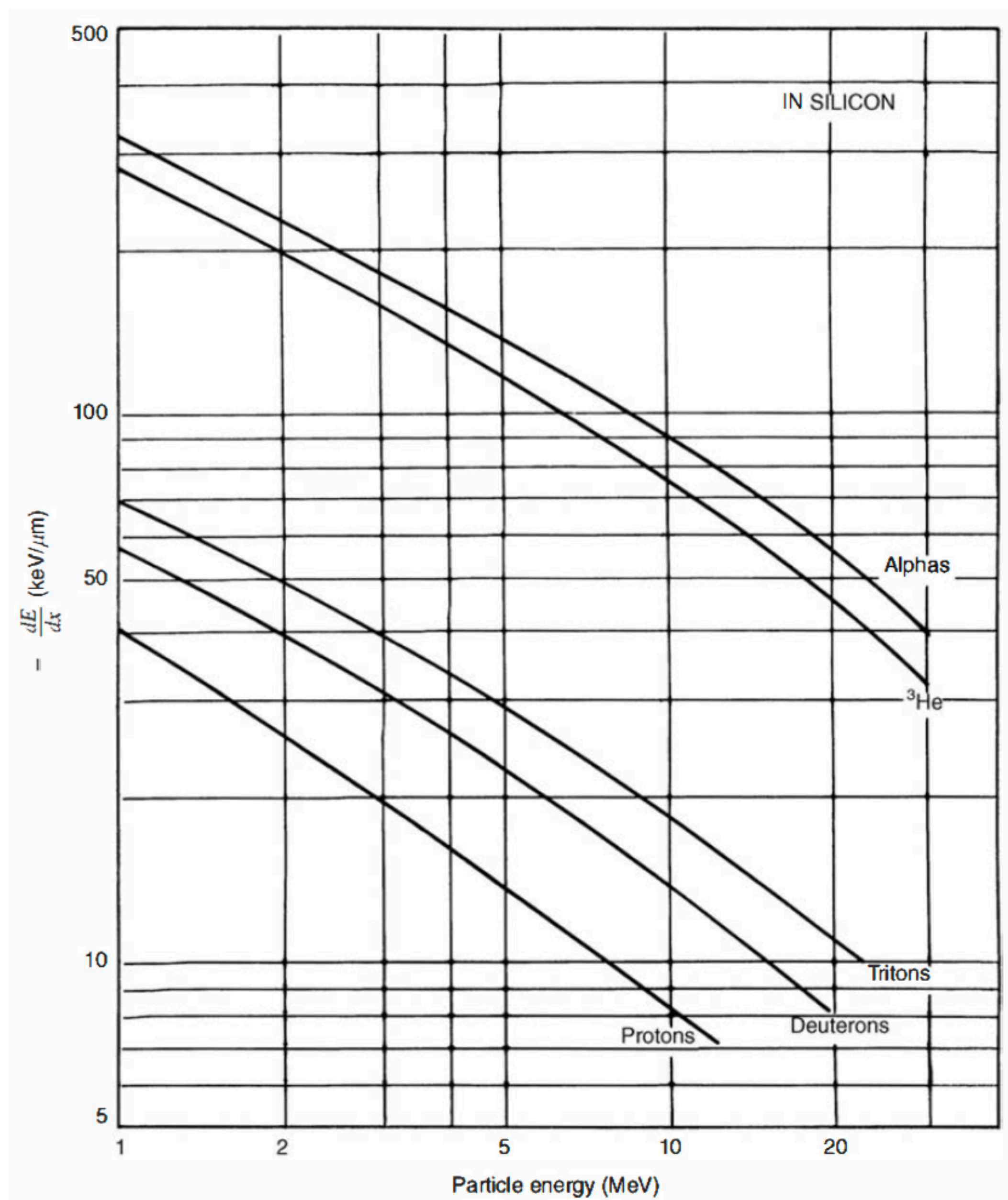


SPETTROSCOPIA ALFA

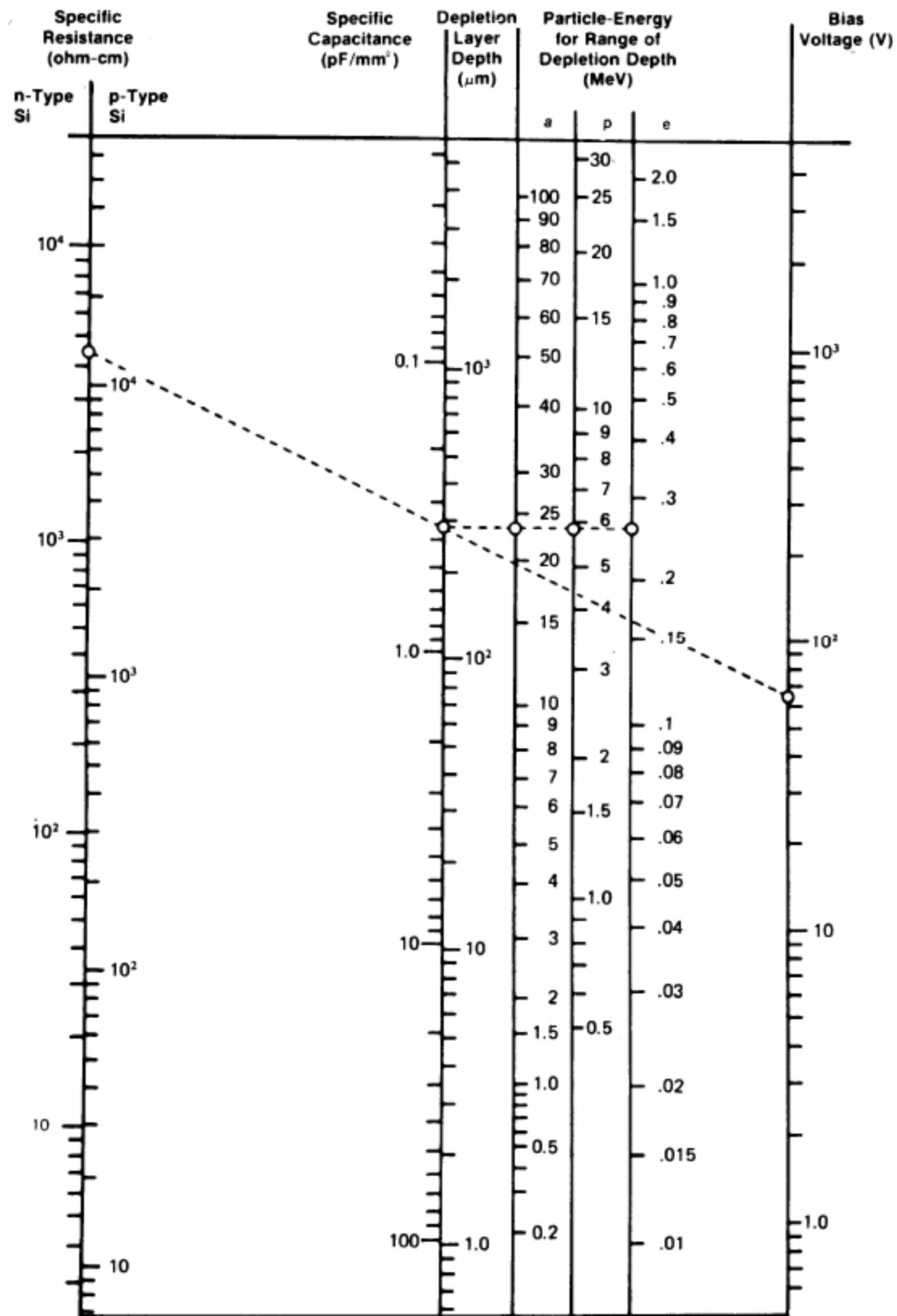
RANGE DELLE PARTICELLE ALFA



PERDITA DI ENERGIA IN SILICIO



RELAZIONE FRA I PARAMETRI DI UN RIVELATORE AL SILICIO A GIUNZIONE



1 μm of Si = 0.2325 mg/cm²
1 mg/cm² of Si = 4.3 μm

Fig. 3. Silicon Detector Parameters Nomograph. [Similar to Nomogram reported by J. L. Blankenship, *IEEE Trans. Nucl. Sci.* NS7 (2-3), 190-195 (1960).]

A straight edge intersecting the center vertical line at the required depletion depth will give combinations of resistivity and detector bias that may be used to achieve that depth. (Shown, for example, is the voltage that must be applied to a 13,000 Ω-cm p-type or 4500 Ω-cm n-type silicon detector to stop a 23-MeV alpha, a 6-MeV proton, or a 250-keV electron within the depletion depth.)

FORMA DEI PICCHI ALFA

FIGURE 5.15 Alpha spectra of samples composed of natural U with different source thicknesses. The peaks on the left and right correspond to ^{238}U and ^{234}U . Spectra are shifted along the vertical axis to show the differences in peak width (resolution) and tailing. *Pöllänen et al. (2005), reprinted by permission of Elsevier Ltd. © 2005.*

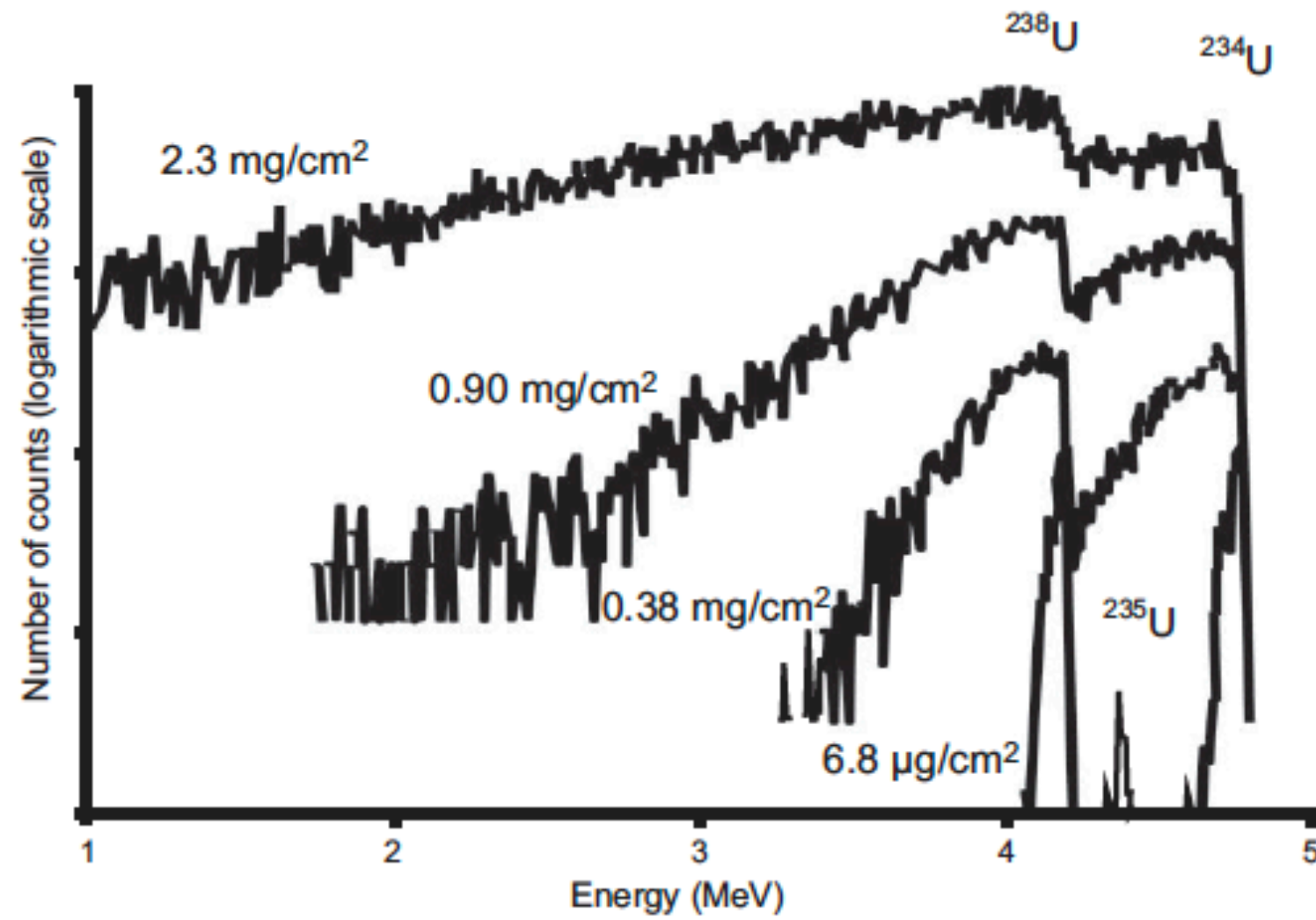


FIGURE 5.17 Simulated alpha spectra of a source containing equal activities of ^{238}U and ^{234}U by assuming different absorber thicknesses (0, 20, and 40 μm). Detector full width at half maximum (here 14 keV) and source thickness (0.4 μm, 6.8 μg/cm²) do not influence the peak shapes significantly. Spectra were generated by the AASI simulation software (*Siiskonen and Pöllänen, 2004*).

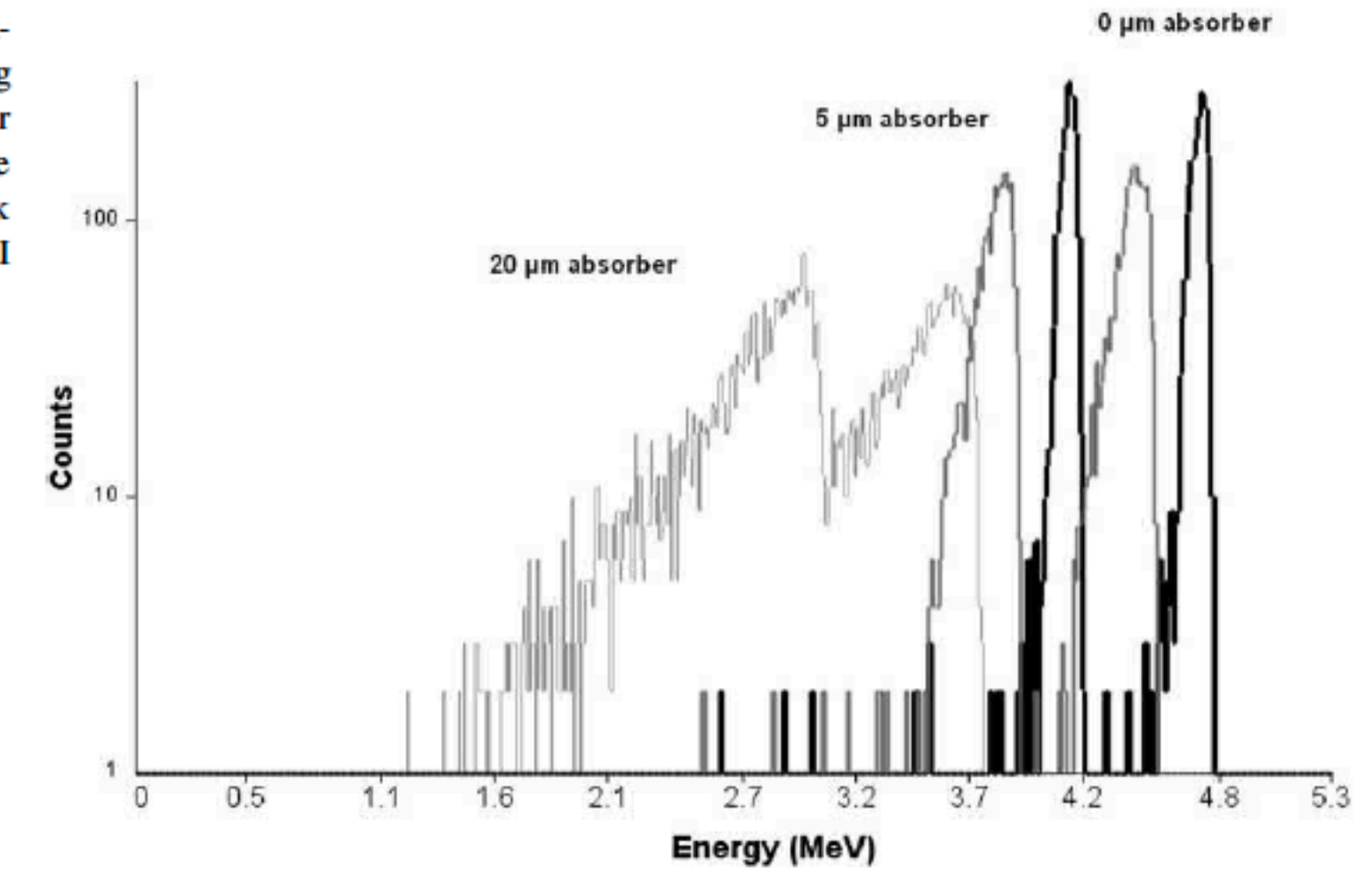


FIGURE 5.18 Simulated alpha spectra of a source containing equal activities of ^{238}U and ^{234}U with varying source thickness (0.4, 20, and 40 μm with source surface densities of 6.4, 320, and 640 μg/cm²). Detector full width at half maximum and absorber thickness are assumed to be 14 keV and 0 μm (0 μg/cm²), not influencing the peak shape significantly. Spectra were generated by the AASI simulation software (*Siiskonen and Pöllänen, 2004*).

