

NEUTRON FLUENCE TO DOSE AND DOSE EQUIVALENT CONVERSION  
FACTORS: A COMPARISON FOR SPECTRA OF INTEREST

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ABSTRACT

Many different sets of neutron fluence to dose and fluence to dose equivalent conversion factors are available for use by dosimetrists. Different sets exist because there is a variety of dose and dose equivalent quantities in use today (e.g.; kerma, effective dose equivalent, individual dose equivalent-penetrating) and because different authoritative bodies (e.g.; International Commission on Radiological Protection) advocate the use of their own set of factors. For the dosimetrist to make informed decisions concerning the selection of a set of conversion factors, differences in results due to the use of various data sets should be known. A good way to compare data sets is by use of the spectrum averaged fluence to dose and fluence to dose equivalent conversion factors developed from those data sets for spectra of interest.

Three different sets of neutron fluence to dose conversion factors and four different sets of neutron fluence to dose equivalent conversion factors have been used to calculate spectrum averaged values for twelve different neutron energy spectra. The spectra for which values have been calculated include Cf-252 (unmoderated and D<sub>2</sub>O-moderated), pressurized water reactors (four locations), and the Health Physics Research Reactor (unmoderated and five moderated spectra). Spectrum averaged values are compared and discussed. Use of different sets of conversion factors leads to dose variations of more than 30% and dose equivalent variations of more than 50%.

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