RESPONSE OF SEVERAL THRESHOLD REACTIONS IN REFERENCE FISSION NEUTRON FIELDS*

by

Donald I. Smith and James W. Meadows

Argonne National Laboratory, Argonne, Illinois 60439, U.S.A.

ABSTRACT

Cross sections for (n,p) reactions on $^{27}\text{At}$, $^{46,47,48}\text{Ti}$, $^{54,56}\text{Fe}$, $^{58,59}\text{Ni}$, $^{59}\text{Co}$, and $^{64}\text{Zn}$ and for $^{238}\text{U}$ fission have been measured in this laboratory relative to fission cross sections for $^{235}\text{U}$ or $^{238}\text{U}$ and the results of this work have been reported. These data have been renormalized to accommodate recent revisions of the $^{235}\text{U}$ and $^{238}\text{U}$ fission evaluated cross sections which are accounted for in the ENDF/B-IV files. The response of the renormalized data to two commonly used reference neutron fields have been investigated: i) pure thermal-neutron fission of $^{235}\text{U}$, and ii) the spontaneous fission of $^{252}\text{Cf}$. The results of this analysis and a comparison with corresponding recent information from the literature are discussed in this report. Two additional topics are addressed in appendices: i) the preparation and calibration of uranium deposits used in cross section measurements, and ii) errata in some earlier reports from our laboratory on this same general subject.

*This work performed under the auspices of the U.S. Energy Research and Development Administration.