



International Atomic Energy Agency

INDC(NDU) - 12/G, L

INDC-302

INDC

INTERNATIONAL NUCLEAR DATA COMMITTEE

REVISION OF VALUES FOR THE 2200 m/s NEUTRON CONSTANTS
FOR FOUR FISSILE NUCLIDES

by

G.C. Hanna¹, C.H. Westcott¹, H.D. Lemmel,

B.R. Leonard Jr.², J.S. Story³ and P.M. Attree

IAEA Vienna

¹ Atomic Energy of Canada Limited, Chalk River, Ontario, Canada

² Battelle-Northwest, Richland, Washington, USA. (Work supported by the United States Atomic Energy Commission under Contract AT(45-1)-1830.)

³ Atomic Energy Establishment, Winfrith, Dorset, England.

THE ORIGINAL MICROFICHE CONTAINS ONLY 2 PAGES

ABSTRACT

This study brings up to date the earlier survey of Westcott et al. 1965 [33] by including all the new information that has become available. The experimental measurements, new and old, have been carefully reviewed. The quality of the input data has been improved, firstly by more detailed consideration of the neutron spectra in which measurements were carried out, and secondly by a new study of the influence of fission neutron spectra and delayed gamma rays on $\bar{\nu}$ measurements. New g factors, revised standard cross section, and new α -decay half-life data are used. The fitting procedure is improved by including the g factors as fitted parameters and by a better treatment of correlated errors. The following values resulted:

RECOMMENDED VALUES FOR 2200 m/s CONSTANTS Cross section in barns

	U ²³³	U ²³⁵	Pu ²³⁹	Pu ²⁴¹
σ_a	577.6 ± 1.8	678.5 ± 1.9	1012.9 ± 4.1	1375.4 ± 8.6
σ_f	530.6 ± 1.9	580.2 ± 1.8	741.6 ± 3.1	1007.3 ± 7.2
σ_γ	47.0 ± 0.9	98.3 ± 1.1	271.3 ± 2.6	368.1 ± 7.8
α	0.0885 ± 0.0018	0.1694 ± 0.0021	0.3659 ± 0.0039	0.3654 ± 0.0090
η	2.2844 ± 0.0063	2.0720 ± 0.0060	2.1085 ± 0.0066	2.149 ± 0.014
$\bar{\nu}_t$	2.4866 ± 0.0069	2.4229 ± 0.0066	2.8799 ± 0.0090	2.934 ± 0.012
g_a	0.9965 ± 0.0013	0.9787 ± 0.0010	1.0752 ± 0.0030	1.0376 ± 0.0014
g_f	0.9950 ± 0.0021	0.9766 ± 0.0016	1.0548 ± 0.0030	1.0486 ± 0.0053
g_η	0.9985 ± 0.0017	0.9978 ± 0.0018	0.9810 ± 0.0027	1.0106 ± 0.0051
σ_s^{bound}	10.7 ± 1.8	17.6 ± 1.5	8.5 ± 2.0	12.0 ± 2.6
		$\bar{\nu}(\text{Cf}^{252}) = 3.765 \pm 0.012$		

Values supposed to be final but may still change slightly.
Not to be quoted prior to publication.