

Evaluation Session – Dec. 1, 2020

R.Q. Wright's updates to MA nubar

- ~ 15 minor actinide nubar
- Motivation? Deficiencies in the current ENDF/B-VIII.0?
 - No outstanding deficiencies noted, but these isotopes don't get a lot of attention
- What new data/theory motivate a new evaluation/update?
 - Maslov, INDC(BLR) reports
 - Midland-Nix model calculations
- What validation testing has been/will be done?
 - No idea!

<https://git.nndc.bnl.gov/endl/library/neutrons/-/issues/2>

PROMPT-NUBAR EVALUATIONS FOR 20 ACTINIDES

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Prompt-nubar Evaluations

Prompt-nubar evaluations were done for eight isotopes of californium, U²³², and eleven other nuclides with short (< 2yr) half-lives.

- Cf isotopes – Madland-Nix calculation
- Pa-230, Pa-232, U-230, U-231, U-232, Am-240, Am-244, Cm-240 – Maslov, INDC(BLR) reports.
- Pu-237 – Madland-Nix calculation.
- Np-234, Np-235 -- R. Q. Wright evaluations
- Es-254m -- evaluation is the same as Es-254

Table I. Input Parameters for Californium Isotopes

Nuclide	Er	Bn	TKE	Eg	Sn
Cf-246	223.034	6.059	192.40	7.034	5.8006
Cf-248	221.497	5.585	190.80	7.062	5.555
Cf-249	219.455	6.623	189.70	7.090	5.4646
Cf-250	220.887	5.111	190.20	7.118	5.3404
Cf-251	219.421	6.170	189.70	7.146	5.217
Cf-252	217.640	4.803	188.20	7.174	5.100
Cf-253	216.150	6.032	187.20	7.202	5.0143
Cf-254	215.862	4.600	186.70	7.230	4.9164

Table II. Heavy and Light Central Fission Fragments

Nuclide	HF	LF
Cf-246	Cs-140	Tc-107
Cf-248	Cs-140	Tc-109
Cf-249	Cs-142	Tc-108
Cf-250	Cs-142	Tc-109
Cf-251	Cs-142	Tc-110
Cf-252	Cs-142	Tc-111
Cf-253	Cs-143	Tc-111
Cf-254	Cs-144	Tc-111

Table III. Values of prompt-nubar at thermal energy

Nuclide	VIII.0	Revised	% diff
Cf-246	3.8093	3.9318	+3.2
Cf-248	4.0145	4.0132	-0.03
Cf-249	4.0727	4.0738	+0.03
Cf-250	3.9597	4.0693	+2.8
Cf-251	4.1418	4.1519	+0.24
Cf-252	4.0613	4.0022	-1.50
Cf-253	4.1413	4.1510	+0.24
Cf-254	4.0482	4.0435	-0.12

U-232 prompt-nubar

