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# WPEC Subgroup C
# HPRL
# High Priority Request List for Nuclear Data

www.oecd-nea.org/dbdata/hprl

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# WPEC Subgroup C / HPRL

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2. Administrative items
3. Report on activities since last meeting
4. New potential requests
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6. Status of NEA webpages and CMS-based HPRL
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## 2. Admin items: EG-HPRL (SG-C) membership

Representatives of nuclear data evaluation projects or countries

ENDF, USA: Y. Danon (RPI)

JEFF, NEA DB: E. Dupont (CEA, F), A. Plompen (EC-JRC-Geel), G. Rimpault (CEA, F), A.G. Smith (Univ. Manchester, UK), [and (TBC) D. Bernard (CEA, F)]

JENDL, Japan: O. Iwamoto (JAEA), N. Iwamoto (JAEA), T. Iwasaki (Tohoku), A. Kimura (JAEA)

BROND, Russia: V. Pronyaev (IPPE), V. Koscheev (IPPE)

CENDL, China: Zhigang Ge (CIAE), Xichao Ruan (CIAE), Sun Weili (IAPCM), Haicheng Wu (CIAE)

IAEA: R. Capote, A. Koning

Korea: Young-Ouk Lee (KAERI)

Romania: A. Negret (IFIN-HH)

NEA: M. Fleming

## 3. Report on activities since last meeting

References of publications related to HPRL entries

- Updates in October 2020, March 2021 and May 2021
- Addition of a total of 14 references to about as many entries plus some dosimetry entries

➠ All: action to report new publications at wpec-sgc@oecd-nea.org

No new request formally submitted

## 4. New potential requests

Medical applications (possible new SPQ category)

- Gamma production (p, x $\gamma$) on C-12, N-14, O-16
- Production of positron-emitters C-10,11, N-12,13, and O-15 in (p,x) reactions on C, N, O

➠ Pending action on R. Capote to draft a request

Fusion energy (IFMIF-DONES)

- d-induced production cross-sections of H-3 and Be-7 in Lithium

➠ Presentation by S. Simakov

## 5. Status of entries < 2017

From “Work in progress” to “Pending new evaluation or validation”

- Pu-240 (n,f) cross section

From “Pending new evaluation or validation” to “Completed”

- Na-23 (n,inl) cross section
- U-235 and Pu-239 PFGS

## 5. Status of entries < 2017

Pu-240 (n,f) xs

Pu-240 (n,f) cross section (https://www.oecd-nea.org/dbdata/hprl/hprlview.pl?ID=457)

Application: Fast Reactors

Requester: SG26 (M. Salvatores)

Date of request: 2008

Energy range: 0.5 keV-5 MeV

Accuracy requested: ~3% (10% in the sub-threshold resonances)

Current status: Work in progress

## 5. Status of entries < 2017

## Pu-240 (n,f) xs

Pu-240 (n,f) cross section (https://www.oecd-nea.org/dbdata/hprl/hprlview.pl?ID=457)

Measurements

- F. Tovesson et al., Neutron induced fission of 240,242Pu from 1 eV to 200 MeV, PRC 79 (2009) 014613
- P. Salvador et al., Neutron-induced fission cross section of 240Pu from 0.5 MeV to 3 MeV, PRC 92 (2015) 014620
- A. Stamatopoulos et al., Investigation of the 240Pu(n,f) reaction at the n_TOF/EAR2 facility in the 9 meV-6 MeV range, PRC 102 (2020) 014616

Proposal: “Work in progress” → “Pending new evaluation or validation”

## 5. Status of entries < 2017

## Na-23 (n,inl) xs

Na-23 (n,inl) cross section (https://www.oecd-nea.org/dbdata/hprl/hprlview.pl?ID=448)

Application: Sodium-cooled Fast Reactor (SFR)

Requester: SG26 (M. Salvatores) in 2008

Energy range: 0.5-1.3 MeV with a target accuracy of ~4-8%

Current status: Pending new evaluation or validation

Measurements

- C. Rouki et al., High resolution measurement of neutron inelastic scattering cross-sections for 23Na, NIM A 672 (2012) 82

## 5. Status of entries < 2017

Na-23 (n,inl) xs

Na-23 (n,inl) cross section (https://www.oecd-nea.org/dbdata/hprl/hprlview.pl?ID=448)

Evaluation/Validation

- D. Rochman et al., On the evaluation of 23Na neutron-induced reactions and validations, NIM A 612 (2010) 374
- S. Kopecky and A. Plompen, R-matrix analysis of the total and inelastic scattering cross sections, EUR 25067 EN (2011)
- P. Archier et al., 23Na evaluation with CONRAD for fast reactor applications, Journal of Korean Physical Society 59 (2011) 915
- P. Archier et al., New JEFF-3.2 Sodium Neutron Induced Cross-sections Evaluation for Neutron Fast Reactors Applications: from 0 to 20 MeV, NDS 118 (2014) 140

## 5. Status of entries < 2017

## Na-23 (n,inl) xs

Na-23 (n,inl) cross section (https://www.oecd-nea.org/dbdata/hprl/hprlview.pl?ID=448)

Proposal: “Pending new evaluation or validation” → “Completed”

Justification: *The Na-23 inelastic scattering cross section has been accurately measured at JRC-Geel. In the framework of the ASTRID SFR project a new evaluation based on both differential and integral information has been prepared for JEFF-3.2 and adopted in JEFF-3.3 with uncertainties matching the request.*

## 5. Status of entries < 2017

PFGS

U-235 PFGS (https://www.oecd-nea.org/dbdata/hprl/hprlview.pl?ID=422)
Pu-239 PFGS (https://www.oecd-nea.org/dbdata/hprl/hprlview.pl?ID=421)

Application: Gen-IV (fast) systems and French RJH (thermal)

Requester: G. Rimpault (CEA, France) in 2006

Energy range: thermal and fast

Accuracy requested: ~7% on the average gamma energy and multiplicity

Current status: Pending new evaluation or validation

## 5. Status of entries < 2017 PFGS

U-235 PFGS (https://www.oecd-nea.org/dbdata/hprl/hprlview.pl?ID=422)
Pu-239 PFGS (https://www.oecd-nea.org/dbdata/hprl/hprlview.pl?ID=421)

Measurements

- E. Kwan et al., Prompt energy distribution of 235U(n,f) gamma at bombarding energies of 1–20 MeV, NIM A 688 (2012) 55
- A. Oberstedt et al., Improved values for the characteristics of prompt-fission g-ray spectra from the reaction 235U(nth,f), PRC 87 (2013) 051602(R)
- A. Chyzh et al., Total prompt g-ray emission in fission of U-235, Pu-239,241, and Cf-252, PRC 90 (2014) 014602
- M. Lebois et al., Comparative measurement of prompt fission g-ray emission from fast-neutron-induced fission of U-235 and U-238, PRC 92 (2015) 034618
- A. Gatera et al., Prompt-fission g-ray spectral characteristics from 239Pu($n_{th}$,f), PRC 95 (2017) 064609

## 5. Status of entries < 2017 PFGS

U-235 PFGS (https://www.oecd-nea.org/dbdata/hprl/hprlview.pl?ID=422)
Pu-239 PFGS (https://www.oecd-nea.org/dbdata/hprl/hprlview.pl?ID=421)

Evaluation

- O. Serot et al., Prompt Fission Gamma Spectra and Multiplicities for JEFF-3.3, JEF/DOC-1828, JEFF Meeting, OECD, Paris (2017)
- A. Tudora, Prompt gamma-ray results of two deterministic modelings of prompt emission in fission, Eur. Phys. J. A 56 (2020) 128
- I. Stetcu et al., Evaluation of the Prompt Fission Gamma Properties for Neutron Induced Fission of U-235,238 and Pu-239, NDS 163 (2020) 261

## 5. Status of entries < 2017 PFGS

U-235 PFGS (https://www.oecd-nea.org/dbdata/hprl/hprlview.pl?ID=422)
Pu-239 PFGS (https://www.oecd-nea.org/dbdata/hprl/hprlview.pl?ID=421)

Proposal: “Pending new evaluation or validation” → “Completed”

Justification: *The characteristics of the PFGS have been measured at thermal and fast energies for both U-235 and Pu-239. Experimental data have been combined with model calculations to evaluate the prompt gamma properties as a function of incident neutron energy for JEFF-3.3 and ENDF/B-VIII.0.*

# 6. Status of NEA webpages and CMS-based HPRL

NEA website upgrade in October 2020

- Migration of the WPEC webpages to the NEA “download area”
- HPRL webpages are still accessible but no longer indexed by Google
- The new official HPRL webpages are still work in progress

➠ Action on NEA to finalize the new official HPRL webpages and to add a direct link to the current HPRL database

CMS-based HPRL

- Presentation by NEA

## 7. Chair replacement

Why?

- Time for new impulse after 5 years
- No spare time (main activities not related to application needs)

When?

- Right now or any suitable time before the end of 2021

There must be a new Chair early 2022

- To prepare the next mandate (2022-2024)
- To prepare the next meeting (2022)

Of course, still available to help the new Chair if needed

➠ Action on NEA to organize the selection/nomination of a new Chair

Thank you for your attention!

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