

Nuclear Data Evaluation Lab. (NDEL) of Korea Atomic Energy Research Institute (KAERI)

Progress Report of 2008/2009 to the
IAEA Technical Meeting on the Network of Nuclear Reaction Data Centres
25-26 May, 2008

Young-Ouk LEE (yolee@kaeri.re.kr)

Web: <http://www.atom.kaeri.re.kr>

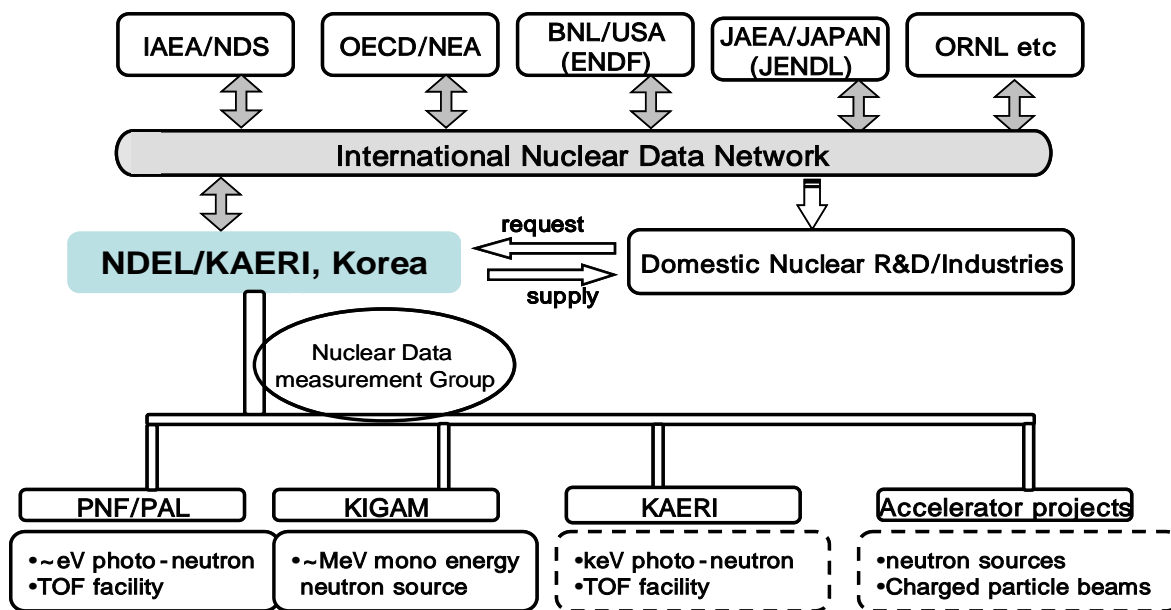
0. General

Nuclear Data Evaluation Laboratory (NDEL) of Korea Atomic Energy Research Institute (KAERI) has 7 staffs (evaluation 3, processing and benchmark 2, applications 2) and 1 secretary. Mission of NDEL includes disseminating outcomes of international network as well as promoting domestic activities related to nuclear data. KAERI/NDEL has been established in 1997, and funded by a stable and steady source of budget from the fiscal year of 2009.

Nuclear data needs are mainly from following major nuclear R&D programs:

- **Advanced Reactor Development** (Liquid Metal Fast Reactor, High Temperature Gas Cooled reactor and Supercritical Water Reactor) requires quantification of cross section uncertainties in their reactor designs.
- **Advanced Fuel Cycle** needs up-to-date neutron cross sections of MA and fission products
- **Accelerator projects** requires high energy neutron and charged particle nuclear data relevant to the radiological safety and beam application of the accelerators
- Usual activities for **the nuclear power plant operation, medical isotope production and the radioisotope applications**, are requesting up-to-date nuclear data

KAERI/NDEL is performing nuclear data evaluation, multi-group library processing, and validation which are required by the above mentioned R&D program in Korea. For measurement of nuclear reaction data, KAERI/NDEL is coordinating measurements of Pohang Neutron Facility (PNF) of Pohang Accelerator Laboratory (PAL), Van de Graff laboratory of Korea Institute of Geosciences and Mineral Resources (KIGAM), and MC-50 Cyclotron at Korea Institute of Radiological and Medical Sciences (KIRAMS)



2. Nuclear data compiled and measured

- The EXFOR compilation activity for the domestic nuclear reaction data is on going since 2009 in the KAERI/NDEL under the guidance of IAEA/NDS. As a part of this work, two EXFOR entries were produced and listed in Table 1. Another entry compiled will be updated by the next compilation control data base.

#	ENTRY	Title	Author
1	31666	The neutron total cross sections of natural palladium	Y.D. Oh
2	D0569	Investigations of the $^{nat}\text{Ti}(p,x)^{43,44m,44g,46,47,48}\text{Sc}, ^{48}\text{V}$	M.U. Khandaker
3	checking	The total neutron cross sections and resonance parameters of natural Niobium	T.F. Wang

- The nuclear data which were measured but not yet be published are listed in the Table 2, which KAERI/NDEL is going to compile into EXFOR with the support of NDS and in collaboration of authors.

#	Title	Author
1	Measurement of some isomeric yield ratios by photonuclear reactions in ^{nat}In , ^{nat}Sn , and ^{197}Au with bremsstrahlung beam	RAHMAN Md. Shakilur
2	The total cross section of ^{nat}W by neutron energies between 800 keV and 1 MeV	Gidong Kim
3	Production cross section of residual radionuclides by proton-induced reactions on natural nickel	Kwangsoo Kim
4	Measurements of maxwellian averaged neutron capture cross sections for $^{56,57}\text{Fe}$	WANG Taofeng
5	Neutron resonance parameter measurements of Gadolinium isotopes	Yeong-rok Kang

3. Facilities

3.1 Pohang Neutron Facility of PAL (Y.D. Oh, ydoh@postech.ac.kr)

Specifications:

- electron energy = 50 - 75 MeV
- repetition rate = 10 ~ 15Hz, pulse width = 1 ~ 2 μ s
- peak beam current = 30 ~ 50 mA
- TOF flight length = 12m
- Target + water moderator to produce neutron pulse
- Ta plates + cooling system
- Detector : scintillator + PM tube
- BC702 [$^6\text{Li-ZnS(Ag)}$] Thickness 1.6cm , diameter 12.5cm
- Sample changer consisting of remotely controlled 4 sample holders

3.2 Van der Graaf of KIGAM (G.D. Kim, gdkim@kigam.re.kr)

Specifications:

- monoenergetic pulsed neutron beam for energies 500 keV ~ 2.2 MeV with TOF system
- based on Van der Graaf with bunching and pulsing
- $^7\text{Li(p,n)}$ reaction with $10^6 \sim 10^7$ neutrons/sec and FWHM < 5 %
- pulsed beam with period 125 ns, width 1-2ns, Time Pick up detecting system
- two plastic detectors (3"x 1 cm)

3.3 MC-50 of KIRAMS (GN Kim, gnkim@knu.ac.kr)

Specifications:

- azimuthally-Varying Field-Type MC-50 cyclotron
- proton beam Energy : ~ 45 MeV, Beam current : < ~ 50 nA
- used for neutron therapy with Be(p,n) reaction and radioisotope production