The Need for Supplementary Coded Information in INIS for its Use as a Source of Bibliographic Data by the Nuclear Data Centres

by

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I. INTRODUCTION

1. This paper should be read in conjunction with the paper by H.D. Lemmel (TC-82/1, Nuclear Data Tagging in INIS) given at this meeting: because of what follows, several references are made to it.

2. The approach adopted in the present work is, however, quite different from Lemmel's. It is more empirical and based on an INIS search provided by the ZAED (Karlsruhe) according to a profile prepared by Dr. H. Behrens following an action issued at the CINDA-Indexer Seminar held at Saclay on 17th and 18th November, 1975. The profile is shown in Annex 1.

II. ANALYSIS OF THE INIS SEARCH

3. For each of the 200 entries examined in this study, the title and the abstract - currently given in INIS - and, occasionally, the original publication itself, have been considered.

About 30% (59/200) of the entries have been found irrelevant to CINDA.

III. PROBLEM

4. What supplementary information would be needed in INIS in order to reduce the number of noise entries to a minimum without losing relevant entries and taking into account that only minor modifications should be introduced and, possibly, generally valid?

IV. PROPOSALS

5. The rejected entries have been classified in 3 main groups. They are listed in Annex 2. Admittedly, there is much arbitrariness in this classification, but the results should not depend on it. The following main pieces of information should always be given in order to make INIS of greater utility to the CINDA compilers:

(a) the incident particle according to the list,
   - no incident particle
   - neutron
   - photon
   - charged particle.

For instance, with this classification, 12 (out of 59) entries concerning charged particle reactions would not have been produced by the search.
(b) the target according to the list,
- isotope or element
- compound
- Fission Product (specific category)
- many isotopes (uncorrelated)
- many \{ even-even spherical, prolate, odd-spherical, etc. \}

where, under "many", also very general-class nuclei have been considered because the corresponding papers could be of much interest to evaluators.

With this classification, another 20 entries would not have appeared in the list.

(c) the purpose of the work described in the paper according to the list
- determination of nuclear data by experiment
- determination of nuclear data by theory
- determination of nuclear data by evaluation
- compilation of nuclear data
- critical review of nuclear data
- use of nuclear data
- nuclear data requirements.

Note 1: the first six items have been taken from H.D. Lemmel's proposal, page 9, paragraph I.

Note 2: the first five items are relevant to CINDA, the last two are not.

The adoption of the above scheme would have eliminated from the INIS search under consideration, another 20 entries.

6. The introduction, or a more precise use of the three items - the incident particle, the target and the purpose of the work - mentioned above would greatly improve the utility of the INIS file for those concerned with nuclear data compilation. The nuclear data type or quantity (cross-section, resonance parameter, half-life, etc.) has been deliberately omitted. As pointed out in Lemmel's paper, page 10 and following pages, this would complicate enormously the INIS compilation. In addition, this would be of no special help to CINDA where all neutron data quantities are considered anyway.

7. Finally, an improved retrievability of INIS according to publication series and geographical criteria (see Lemmel's paper, page 8, paragraph 9) would be welcomed by the Nuclear Data Centres.
List of the entries (publication titles or short abstracts) not relevant to CINDA found in the search analysed in the paper TC-82/8

First Group
Incident particle = charged particle

(1) Study of Sm-144(d,p) reaction at 19 MeV
(2) Direct interaction (d,p),(p,d) reactions
(3) Disintegration of nuclei by 1.2 GeV electrons
(4) Cl-37(d,p),K-39(d,p) reactions
(5) Mg-24 and Mg-26 α-capture reactions
(6) Excited states of S-33 after S-32(d,p) reaction. Comparison with (n,n),(n,γ) studies (*)
(7) The observables in nucleon-deuteron elastic scattering
(8) Spectroscopic factors in Ni-61 by (d,p) reactions
(9) Pb-208(d,p) and Pb-208(p,d) analysis
(10) Study of the Sn-118(d,p) reaction at 17 MeV
(11) Si-28(0-16,γ)Ca-44 - level study. Comparison with (n,γ) results (*)
(12) Mg-24(d,p) reaction.

(*), probably acceptable in CINDA.
ANNEX 2

List of the entries (publication titles or short abstracts) not relevant to CINDA found in the search analysed in the paper TC-82/8

Second Group
Target not given

(1) Interactive system for self-shielded resonance absorption cross-section evaluation
(2) Fast neutron capture cross-section facility at CAD
(3) Use of nuclear models in cross-section calculations
(4) Extension of validity of THRESH hybrid empirical-statistical model code
(5) Description of ORGLS2 code for neutron capture data analysis
(6) Fast neutron capture: theory and experiments - Review
(7) Transport phenomena
(8) Neutron age calculations: improvements
(9) Magnetic diffraction of neutrons
(10) Doubly radiative (n,p) capture
(11) Precompound emission mechanism in nuclear reactions
(12) Comparison of (n,n), (n,p), (p,p) reactions: charge independence
(13) Nuclear reactions. (Chapter 1)
(14) Role of entrance and exit doorways for low energy nucleons
(15) Shell approach to theory of low energy neutron capture
(16) True characteristics of $\sigma_{pot}$ and capture of slow $S$-neutrons
(17) Direct capture, conclusions and other non-statistical effects
(18) Neutron capture $\gamma$-spectra in thermal and resonance region - review of the situation
(19) Neutron and $\gamma$-ray strengths in high resolution capture $\gamma$-ray spectra analysis

Target and incident particle not given

(20) 3-body system: approximation to soft-core potentials
(21) 3-body reactions: models
(22) 3-body reactions
(23) Super-heavy element synthesis
(24) Super heavy element synthesis
(25) Comparison of various level density formulae
(26) Mixing of the transitions from $3^+$ quasi $\gamma$-band level in Gd-152
(27) Magnetic moments of excited states of Dy
(28) Neutron capture $\gamma$-spectra in thermal and resonance region - review of the situation.
Second Group
Target and incident particle not given

(29) neutrons and γ-ray strengths in high resolution capture γ-ray spectra analysis.

Third Group
purpose = nuclear data use or requirement

(1) spectra in graphite lattices, solid state physics parameters
(2) comparison of calculation (library + code) with experimental results
(target nuclei given as descriptors)
(3) recoil of Ge-73 atoms following the Ge-72(n,γ) reaction
(4) Di-muon production by high energy neutrons (n+Be → μ⁺μ⁻ + X)
(5) report on activities of Institutes and Departments in KFK
(6) use of ENDF/B-IV data : examples
(7) quantitative assessment of CTR cross-section needs and application
to CTS design project
(8) sensitivity studies : higher Pu-isotopes data
(9) neutron and γ-data requirements for gas-cooled FBR
(10) re-orientation of nuclei in solids by means of β⁻ and γ-decay anisotropy
following (n,γ) reactions (target given)
(11) neutron spectra in D₂O ice assemblies - scattering kernels
(12) sensitivity studies in Fe-shield : (n,γ) in keV range
(13) multiple scattering of neutrons in thick targets in resonance region
(14) neutron spectra in Oralloy sphere with 14 MeV neutron source
(15) Japanese WRENDA list
(16) report of Nuclear Physics Division (Bhabha Centre)
(17) TNG cross-section measurements at Livermore. NDG.
(18) ORIGEN library : data revision
(19) Di-muon production by high energy neutrons (n+Be → μ⁺μ⁻ + X)
(20) calculation of decay power of Fission Product)