IAEA-NDS- 21
Rev. 4

INTERNATIONAL ATOMIC ENERGY AGENCY

NUCLEAR DATA SERVICES

DOCUMENTATION SERIES OF THE IAEA NUCLEAR DATA SECTION

KEDAK-4

Karlsruhe evaluated neutron data library

Brief summary of contents and format

This summary is an aid to customers of the IAEA Nuclear Data Section when receiving data retrievals in KEDAK format. The KEDAK-4 Library or a selective retrieval from it is available costfree upon request.

H.D. Lemmel

September 1986

IAEA NUCLEAR DATA SECTION, P.O. BOX 100, A-1400 VIENNA

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TEXT

930237	24					48
32070	14560	32060	14580	14590	32510	48
34520	14570	21520	30270	30190	31020	48
30040	30050	30020	40022	30010	32010	48

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Introduction

Version 4 of the Karlsruhe evaluated neutron data library KEDAK was received at the IAEA in Dec. 1983. It contains 57 evaluations with a total of 241770 records. It supersedes the previous version KEDAK-3.

At present we do not have a detailed documentation and do not know which evaluations have been taken over unchanged from KEDAK-3, or what changes have been made compared to KEDAK-3.

This document gives

- a list of evaluations included, sorted by nuclides;
- and a computer listing of the heading records of each evaluation which contain the numerical equivalents of the data types included and, in some cases, explanatory text; the listing is in the sequence of accession-numbers.

Documentation:

See IAEA-NDS-21 for documentation of the KEDAK format.

For the documentation of evaluations, we presently cannot do better than referring to CINDA. For the old evaluations the documentation of KEDAK-3 may still be helpful, in particular:

B. Goel, B. Krieg, KFK-2234 (1975) - Text

B. Goel, KFK-2233 (1975) - Graphical plots for the non-fissile materials.

For an additional evaluation in KEDAK format (Cm-244) see the data library INDL/A(83) documented in IAEA-NDS-12 Rev. 7. This document includes also some additional information on the actinide evaluations included in KEDAK-4.

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Material	Acc-Nr.	Nr. of Lines
1-H-1	38	8
1-H-1(H_2)	23	401
1-H-1(H_2O)	24	384
1-H-2	22	370
1-H-3	57	319
2-He-3	25	282
2-He-4	26	341
6-C-12	10	1085
7-N	35	376
8-O-16	7	2729
11-Na-23	36	3117
13-Al-27	9	1423
17-Cl	39	871
17-Cl-35	40	8
-37	41	8
24-Cr	12	4294
24-Cr-50	13	72
-52	14	186
-53	15	69
-54	16	60
26-Fe	17	6765
26-Fe-54	18	168
-56	19	173
-57	20	77
-58	21	38
28-Ni	1	4845
28-Ni-58	2	510
-59	46	481
-60	3	86
-61	4	62
-62	5	67
-64	6	33
42-Mo	27	3605

Material	Acc-Nr.	Nr. of Lines
42-Mo-92	28	69
-94	29	78
-95	30	98
-96	31	77
-97	32	92
-98	33	71
-100	34	69
48-Cd	11	7904
90-Th-232	49	18310
92-U-233	45	4052
92-U-235	8	21951
92-U-237	47	301
92-U-238	37	21941
93-Np-237	48	16158
94-Pu-238	51	12043
94-Pu-239	52	26369
94-Pu-240	42	24144
94-Pu-241	44	9605
94-Pu-242	43	7034
95-Am-241	53	11350
95-Am-242	54	1044
95-Am-243	55	13601
96-Cm-244	50	9794
96-Cm-246	56	2291

Notes:

The accession-numbers 46-57 are new evaluations for nuclides not included in KEDAK-3. The other evaluations may be either identical to KEDAK-3 or revisions to KEDAK-3.

- For Cl, Cr, Fe, Ni, Mo the isotopic files should be used together with the element-files.
- For the resonance-parameters of Cr, Fe, Ni see the data file EXFOR-V0025.

Quick Guide to KEDAK* Library

The Karlsruhe evaluated nuclear data file KEDAK is a magnetic tape file consisting of one or more tapes.

In the following pages, the "card-image" format of the external KEDAK library is described, it can be used as a quick guide to read the computer listing.

Documentation

D. Woll, KFK-880 (1968) and B. Krieg, KFK-1725 (1973)

Computer programs for use with KEDAK

"The KEDAK Program Compendium" was published under the report number KFK-2387 consisting of several parts:

Part I:

Part II: B. Krig; KEDAK Basic Management, February 1977

Part III: E. Stein; KEDAK Data Retrieval, April 1977

Part IV:

Part V: F.H. Fröhner; KEDAK Evaluation Aids, April 1977

Part VI: E. Stein; Mechanized Transfer of Nuclear Data from ENDF/B to KEDAK and vice versa, March 1978

Part VII: I. Langner, R. Mayer; CALCUL - Calculation of Composed Cross-Sections, Nov. 1977

KFK-2388: I. Bröders, B. Krieg; MIGROS-3, A code for the generation of group constants for reactor calculations from neutron nuclear data in KEDAK format.

Data type	Name of data type	Structure of information (in FORTRAN format E 12.6)
14510	Bibliographic information	Data types and energy regions of recent evaluations
14511	Resonance information	E_{min}; E_{max}; no. of resonances; flag for group constant calculations ("2" if pointwise cross section values to be used, "1" if resolved resonance parameters and "0" if no preference can be recommended).
14580	General information	Atomic weight (A); Atomic number (Z); nuclear spin of ground state (I).

Data type	Name of data type	Structure of information (in FORTRAN format E 12.6)
14590	General information	Reduced neutron wave length; nuclear radius; binding energy of last neutron in compound nucleus.
14600	General information	Isotope atomic weight; isotopic abundance (%).
14570	$\bar{\nu}_t$	Average total number of fission neutrons.
14560	-	Parameters of the Cranberg fission spectrum.
21520	Resolved Res. Para.	Resonance energy; l; J; gJ; Γ_t; Γ_n; Γ_γ; Γ_f; Γ_p; Γ_α; $\Gamma_{n'}$.
21530	Unresolved Res. Para.	$\underline{l}$; $\underline{J}$; $\overline{\Gamma_\gamma}$; $\overline{D}$; $\overline{\Gamma_n^o}$; $\overline{\Gamma_n^o}/D$; No. of exit channels in fission; no. of exit channels in neutron elastic scattering.
21540	URP	D; level density paramter "a"; $2\sigma^2$.
21550	URP	$\underline{E}$; $\underline{l}$; $\underline{J}$; No. of exit channels in fission; $\overline{\Gamma_f}$; $\overline{\Gamma_\gamma}$; $\overline{\Gamma_n}$; S_f; S_γ; R_f; R_γ.
30010	TOTAL	E; σ; E; σ; ... etc.
30020	ELASTIC	E; σ; E; σ; ... etc.
30030	NON-ELASTIC	E; σ; E; σ; ... etc.
30040	Total INELASTIC	E; σ; E; σ; ... etc.
30050	Partial Inelastic	E; σ; E; σ; ... etc. (for excited levels from 1 to continuum).
30051	Inelastic to Continuum	E; σ; E; σ; ... etc.
30160	(n,2n)	E; σ; E; σ; ... etc.
30170	(n,3n)	E; σ; E; σ; ... etc.
30190	Fission	E; σ; E; σ; ... etc.
30220	(n,n'α)	E; σ; E; σ; ... etc.
30230	(n,n'3α)	E; σ; E; σ; ... etc.
30240	(n,2nα)	E; σ; E; σ; ... etc.

Data type	Name of data type	Structure of information (in FORTRAN format E 12.6)
30250	(n,3nα)	E; σ; E; σ; ... etc.
30270	ABSORPTION	E; σ; E; σ; ... etc.
30280	(n,n'p)	E; σ; E; σ; ... etc.
30290	$\sigma_n + \sigma_{n'}$	E; σ; E; σ; ... etc.
31020	(n,γ)	E; σ; E; σ; ... etc.
31030	(n,p)	E; σ; E; σ; ... etc.
31040	(n,d)	E; σ; E; σ; ... etc.
31050	(n,t)	E; σ; E; σ; ... etc.
31060	(n,He^3)	E; σ; E; σ; ... etc.
31070	(n,α)	E; σ; E; σ; ... etc.
31080	(n,2α)	E; σ; E; σ; ... etc.
32010	TRANSPORT	E; σ; E; σ; ... etc.
32060	ETA	Average number of fission neutrons per neutron absorption.
32070	ALPHA	Ratio of capture to fission cross section
32510	$\overline{\text{Cos. }\Theta}$	Average cosine of the elastic scattering angle in L-system.
34520	$\bar{\nu}$	Average number of fission neutrons.
34550	$\bar{\nu}_p$	Average number of prompt fission neutrons.
34610	-	Energy spectrum of prompt fission neutrons (thermal fission).
34620	-	Energy spectrum of delayed fission neutrons (thermal fission).
40022	Diff. Elastic	Cos. Θ; σ; Cos. Θ; σ; ... etc. (in CM-System)

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TEXT

```
      280000          16                                                    1
       14510       14580       14590       14600       32510       30270  1
       31070       31020       30040       30050       30020       40022  1
       31030       30010       32010       30160                          1
      280000       14510           0           1           1           0  1
          81                                                                1
                              ***NI   ***                                   1
DATA RE-EVALUATION IN COMPARISON WITH NFK 120 (1966)                        1
1970:   SGG    1MEV - 15MEV,                                                1
        SGALP,SGP,SG2N   THRESHOLD - 15MEV,                                 1
        SGT,SGN,SGI,MUEL   10MEV - 15MEV.                                   1
R. MEYER INTERNAL REPORT                                                    1
1975:   SGG REVISED ABOVE 200 KEV                                          1
        SGI REVISED ABOVE 4 MEV                                             1
B. GOEL TO BE PUBLISHED                                                     1
------------------------------------------------------------------------------
      280058          10                                                    2
       14580       14590       14511       21520       31070       31020  2
       31030       30160       21530       21540                          2
      280058       14580           0           0           3           0  2
           1                                                                2
 5.79353E+01 2.80000E+01 0.0                                                2
------------------------------------------------------------------------------
      280060           9                                                    3
       14580       14590       14511       21520       31070       31030  3
       30160       21530       21540                                      3
      280060       14580           0           0           3           0  3
           1                                                                3
 5.99310E+01 2.80000E+01 0.0                                                3
------------------------------------------------------------------------------
      280061           6                                                    4
       14580       14590       31070       31030       30160       21540  4
      280061       14580           0           0           3           0  4
           1                                                                4
 6.09301E+01 2.80000E+01-1.50000E+00                                        4
------------------------------------------------------------------------------
      280062           8                                                    5
       14580       14590       14511       21520       31070       31030  5
       30160       21540                                                  5
      280062       14580           0           0           3           0  5
           1                                                                5
 6.19283E+01 2.80000E+01 0.0                                                5
------------------------------------------------------------------------------
      280064           6                                                    6
       14580       14590       31070       31030       30160       21540  6
      280064       14580           0           0           3           0  6
           1                                                                6
 6.39280E+01 2.80000E+01 0.0                                                6
------------------------------------------------------------------------------
       80016          19                                                    7
       14510       14580       14590       32510       14511       21520  7
       30270       31070       31040       31020       30040       30050  7
       30020       40022       31030       30010       32010       30030  7
       30160                                                              7
       80016       14510           0           1           1           0  7
          45                                                                7
                              ***0  16***                                   7
1975: DATA EXTENDED TO 15 MEV                                               7
      DATA REVISED FOR SCATTERING CROSS SECTIONS, SGG, SGP, SGD AND         7
      SGALP                                                                 7
F. WELLER AND B. GOEL 1975 TO BE PUBLISHED                                  7
------------------------------------------------------------------------------
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TEXT

```
      920235         27                                                    8
       14510      32070      14560      34610      32060      14580       8
       14590      32510      34520      14570      14511      21520       8
       30270      31070      30190      31020      30040      30050       8
       30020      40022      31030      30010      30160      30170       8
       21530      21540      21550                                        8
      920235      14510          0          1          1          0       8
         234                                                              8
                                ***U 235***                               8
DATA RE-EVALUATION IN COMPARISON WITH KFK 120 (1966)                      8
1971: ABOVE RESOLVED RESONANCE REGION CROSS SECTIONS COMPLETELY CHANGED.   8
      NEW EVALUATIONS FOR:                                                8
      ALPHA      150EV - 15MEV,                                           8
      NUE        1.E-3EV - 15MEV,                                         8
      SGF        150EV - 15MEV,                                           8
      SGT        150EV - 15MEV.                                           8
      REPORTED IN KFK1629=EANDC(E) 151 U                                  8
1975: SGF REEVALUATED BETWEEN 1 MEV - 15 MEV BASED ON THE FOLLOWING       8
          REFERENCES                                                      8
          J. B. CZIRR AND G. S. SIDHU, NSE, 57 (1975) 18                  8
          V. M. PANKRATOV, N. A. VASLOV, B. V. RYBAKOV, JNE A/B 161       8
          (1962) 494                                                      8
          V. M. PANKRATOV, SOV. J. AT. ENERG. 14 (1963) 167               8
          P. H. WHITE, J. NUCL.ENERG. 19 (1965) 325                       8
          G. HANSEN, S.MCGUIRE, R. K. SMITH, PRIV. COMMUNICATION TO       8
          DR. L. STEWART (1970)                                           8
          B. C. DIVEN, PHYS. REV. 105 (1957) 1350                         8
F.WELLER TO BE PUBLISHED                                                  8
      SGT REEVALUATED BETWEEN 100 KEV AND 15 MEV BASED ON FOLLOWING       8
          PUBLISHED WORK                                                  8
          CABE, CEA-R-45 24 (1973)                                        8
          GLASGOW AND FOSTER, PHYS. REV. LETTERS 22 (1969) 139            8
          SCHWARTZ ET AL  NSE 54 (1974) 322                               8
B. GOEL TO BE PUBLISHED                                                   8
-------------------------------------------------------------------------
      130027         20                                                    9
       14510      14580      14590      32510      14511      21520       9
       30270      31070      31020      30040      30050      30020       9
       40022      31030      30010      32010      30030      30160       9
       21530      21540                                                   9
      130027      14510          0          1          1          0       9
          81                                                              9
                                ***AL 27***                               9
    1967 - 1969 REEVALUATION OF THE DATA FOR RESOLVED AND STATISTICAL      9
           RESONANCE PARAMETERS, ELASTIC SCATTERING AND ITS ANGULAR        9
           DISTRIBUTIONS ABOVE 100 KEV                                    9
B.HINKELMANN ET AL  KFK 1340 (1971)                                       9
     1975: DATA FOR 5.9 KEV RESONANCE CORRECTED                           9
           SGG REVISED BETWEEN 0.1 EV AND 7 KEV                           9
           SGI, SGP, SGALP MODIFIED ABOVE 10 MEV                          9
B.GOEL TO BE PUBLISHED                                                    9
-------------------------------------------------------------------------
       60012         19                                                   10
       14510      14580      14590      32510      14511      21520      10
       30270      31070      31020      30040      30050      30230      10
       30020      40022      31030      30010      32010      30030      10
       30160                                                            10
       60012      14510          0          1          1          0      10
          90                                                            10
                                ***C  12***                               10
DATA CHANGES AFTER PUBLICATION OF KFK 120(1966):                          10
     1971: DATA EXTENDED TO 15MEV.NEW EVALUATIONS FOR:                    10
           SGT,SGX,SGN: 10-15MEV                                          10
           SGI,SGIZ:THRESHOLD -15MEV FOR LEVELS UP TO 11.88MEV            10
           SGALP,SGP,SGI3A: THRESHOLD - 15MEV                             10
     1975: SGG REVISED ABOVE 1 EV USING THE 1/V ENERGY DEPENDENCE         10
           SGT REVISED BELOW 1.4 MEV USING THE NDS FORMULA                10
           SGT = 4.757 - 3.419*E + 1.5488*E**2 - 0.328*E**3               10
B.GOEL TO BE PUBLISHED                                                    10
      480000         17                                                   11
       14510      14580      14600      32510      14511      21520      11
       30270      31070      31020      30040      30050      30020      11
       31030      30010      32010      30030      30160                 11
      480000      14510          0          1          1          0      11
          36                                                            11
                                ***CD   ***                               11
DATA CHANGES IN COMPARISON TO DESCRIPTION IN KFK1080(1969)                11
1975:  MUEL BETWEEN 1.E-3EV AND 100KEV,I.E. RANGE OF ISOTROPIC            11
       SCATTERING IN THE CENTER-OF-MASS SYSTEM WAS CORRECTED              11
-------------------------------------------------------------------------
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TEXT

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      240000          16                                                    12
       14510       14580       14590       14600       32510       30270  12
       31070       31020       30040       30050       30020       40022  12
       31030       30010       32010       30160                          12
      240000       14510           0           1           1           0  12
          81                                                                12
                                ***CR   ***                                 12
DATA RE-EVALUATION IN COMPARISON WITH KFK 120 (1966)                        12
1970:   SGG    1MEV - 15MEV,                                                12
        SGALP,SGP,SG2N   THRESHOLD - 15MEV,                                 12
        SGT,SGN,SGI,MUEL   10MEV - 15MEV.                                   12
R.MEYER INTERNAL REPORT                                                     12
1975:   SGG REVISED ABOVE 100 KEV                                          12
        SGI REVISED ABOVE 100 KEV                                           12
B. GOEL TO BE PUBLISHED                                                     12
-------------------------------------------------------------------------------
      240050          9                                                     13
       14580       14590       14511       21520       31070       31030  13
       30160       21530       21540                                      13
      240050       14580           0           0           3           0  13
           1                                                                13
 4.99460E+01 2.40000E+01 0.0                                                13
-------------------------------------------------------------------------------
      240052          9                                                     14
       14580       14590       14511       21520       31070       31030  14
       30160       21530       21540                                      14
      240052       14580           0           0           3           0  14
           1                                                                14
 5.19405E+01 2.40000E+01 0.0                                                14
-------------------------------------------------------------------------------
      240053          9                                                     15
       14580       14590       14511       21520       31070       31030  15
       30160       21530       21540                                      15
      240053       14580           0           0           3           0  15
           1                                                                15
 5.29406E+01 2.40000E+01-1.50000E+00                                        15
-------------------------------------------------------------------------------
      240054          9                                                     16
       14580       14590       14511       21520       31070       31030  16
       30160       21530       21540                                      16
      240054       14580           0           0           3           0  16
           1                                                                16
 5.39389E+01 2.40000E+01 0.0                                                16
-------------------------------------------------------------------------------
      260000          17                                                    17
       14510       50910       14580       14590       14600       32510  17
       30270       31070       31020       30040       30050       30020  17
       40022       31030       30010       32010       30160              17
      260000       14510           0           1           1           0  17
          54                                                                17
                                ***FE   ***                                 17
DATA RE-EVALUATION IN COMPARISON WITH KFK 120 (1966)                        17
1970:   SGG    1MEV - 15MEV,                                                17
        SGALP,SGP,SG2N   THRESHOLD - 15MEV,                                 17
        SGT,SGN,SGI,MUEL   10MEV - 15MEV.                                   17
R. MEYER INTERNAL REPORT                                                    17
-------------------------------------------------------------------------------
      260054          9                                                     18
       14580       14590       14511       21520       31070       31030  18
       30160       21530       21540                                      18
      260054       14580           0           0           3           0  18
           1                                                                18
 5.39396E+01 2.60000E+01 0.0                                                18
-------------------------------------------------------------------------------
      260056          9                                                     19
       14580       14590       14511       21520       31070       31030  19
       30160       21530       21540                                      19
      260056       14580           0           0           3           0  19
           1                                                                19
 5.59349E+01 2.60000E+01 0.0                                                19
-------------------------------------------------------------------------------
      260057          9                                                     20
       14580       14590       14511       21520       31070       31030  20
       30160       21530       21540                                      20
      260057       14580           0           0           3           0  20
           1                                                                20
 5.69350E+01 2.60000E+01-5.00000E-01                                        20
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                                         TEXT
------------------------------------------------------------------------------------------
       260058          5                                                         21
        14580      14590      31070      31030      21540                         21
       260058      14580          0          0          3          0              21
            1                                                                     21
  5.79333E+01 2.60000E+01 0.0                                                     21
------------------------------------------------------------------------------------------
        10002         15                                                          22
        14510      14580      14590      32510      30270      31070              22
        31020      30040      30020      40022      31030      30010              22
        32010      30030      30160                                               22
        10002      14510          0          1          1          0              22
           54                                                                     22
                             ***H   2***                                          22
 1975: DATA EXTENDED TO 15 MEV                                                    22
      SGG REVISED ABOVE 1 KEV USING 1/V LAW                                       22
      SGN, SGT REVISED ABOVE 1 KEV                                                22
      SG2N REVISED                                                                22
 B.GOEL TO BE PUBLISHED IN KFK REPORT                                             22
------------------------------------------------------------------------------------------
        11001         13                                                          23
        14510      32510      30270      31070      31020      30040              23
        30020      40022      31030      30010      32010      30030              23
        30160                                                                     23
        11001      14510          0          1          1          0              23
           81                                                                     23
                             ***H  H1***                                          23
 DATA CHANGES AFTER PUBLICATION OF KFK 120(1966)                                  23
      1971: SGT 0.7-15MEV WAS FITTED TO REF(1)                                    23
            SGG 0.001EV - 15MEV TAKEN FROM REF(2).                                23
            SGNC CALCULATED FROM REF(3).                                          23
            MUEL EVALUATED FROM SGNC.                                             23
      (1)S.CIERJACKS ET.AL.,KFK1027,1969                                          23
      (2)A.HORSLEY,NUCL.DATA A2,243,1966                                          23
      (3)J.C.HOPKINS,G.BREIT,NUCL.DATA A9,137,1971.                               23
------------------------------------------------------------------------------------------
        12001         13                                                          24
        14510      32510      30270      31070      31020      30040              24
        30020      40022      31030      30010      32010      30030              24
        30160                                                                     24
        12001      14510          0          1          1          0              24
           90                                                                     24
                             ***H  D1***                                          24
 DATA REVISE IN 1971                                                              24
      EXTEND UP TO 15 MEV                                                         24
      SGT 0.7 MEV - 15 MEV FITTED TO S. CIERJACKS KFK 1027 (1969)                 24
      SGG 0.001 EV TO 15 MEV  A.HORSLEY, NUCL. DATA A2 (1966) 243                 24
      MUEL,SGNC   CALCULATED FROM J. C. HOPKINS, G. BREIT                         24
                    NUCL. DATA A9 (1971) 137                                      24
      1975: SGT BELOW 0.7 MEV REVISED REF. 2                                      24
            SGN BELOW 0.7 MEV REVISED REF. 2                                      24
 B. GOEL TO BE PUBLISHED                                                          24
------------------------------------------------------------------------------------------
        20003         14                                                          25
        14510      14560      14590      32510      30270      31040              25
        31020      30040      30020      40022      31030      30010              25
        32010      30030                                                          25
        20003      14510          0          1          1          0              25
           27                                                                     25
                             ***HE  3***                                          25
 EXTENDED TO 15 MEV                                                               25
 B. GOEL  NOV. 1976                                                               25
------------------------------------------------------------------------------------------
        20004         12                                                          26
        14510      14580      14590      32510      30270      31020              26
        30040      30020      40022      30010      32010      30030              26
        20004      14510          0          1          1          0              26
           27                                                                     26
                             ***HE  4***                                          26
 EXTENDED TO 15 MEV                                                               26
 B. GOEL  NOV. 1976                                                               26
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```
                                 TEXT
------------------------------------------------------------------------------------------
      420000        19                                                              27
       14510     14580       14590       14600       32510       14511              27
       21520     30270       31070       31020       30040       30050              27
       30020     40022       31030       30010       32010       30030              27
       30160                                                                        27
      420000     14510           0           1           1           0              27
          63                                                                        27
                            ***MD    ***                                            27
  DATA CHANGES AFTER PUBLICATION OF KFK 120(1966)                                   27
       1970: DATA EXTENDED TO 15MEV.NEW EVALUATIONS FOR                             27
             SGT,SGI,SGN: 10-15 MEV.                                                27
             SGG: 1-15MEV                                                           27
             SGP,SGALF,SG2N:THRESHOLD - 15MEV FOR ALL ISOTOPES.                     27
  R.MEYER INTERNAL REPORT                                                           27
------------------------------------------------------------------------------------------
      420092         9                                                              28
       14580     14590       14511       21520       31070       31030              28
       30160     21530       21540                                                  28
      420092     14580           0           0           3           0              28
           1                                                                        28
   9.19068E+01 4.20000E+01 0.0                                                      28
------------------------------------------------------------------------------------------
      420094         9                                                              29
       14580     14590       14511       21520       31070       31030              29
       30160     21530       21540                                                  29
      420094     14580           0           0           3           0              29
           1                                                                        29
   9.39059E+01 4.20000E+01 0.0                                                      29
------------------------------------------------------------------------------------------
      420095         9                                                              30
       14580     14590       14511       21520       31070       31030              30
       30160     21530       21540                                                  30
      420095     14580           0           0           3           0              30
           1                                                                        30
   9.49058E+01 4.20000E+01 2.50000E+00                                              30
------------------------------------------------------------------------------------------
      420096         9                                                              31
       14580     14590       14511       21520       31070       31030              31
       30160     21530       21540                                                  31
      420096     14580           0           0           3           0              31
           1                                                                        31
   9.59047E+01 4.20000E+01 0.0                                                      31
------------------------------------------------------------------------------------------
      420097         9                                                              32
       14580     14590       14511       21520       31070       31030              32
       30160     21530       21540                                                  32
      420097     14580           0           0           3           0              32
           1                                                                        32
   9.69060E+01 4.20000E+01 2.50000E+00                                              32
------------------------------------------------------------------------------------------
      420098         9                                                              33
       14580     14590       14511       21520       31070       31030              33
       30160     21530       21540                                                  33
      420098     14580           0           0           3           0              33
           1                                                                        33
   9.79054E+01 4.20000E+01 0.0                                                      33
------------------------------------------------------------------------------------------
      420100         9                                                              34
       14580     14590       14511       21520       31070       31030              34
       30160     21530       21540                                                  34
      420100     14580           0           0           3           0              34
           1                                                                        34
   9.99075E+01 4.20000E+01 0.0                                                      34
------------------------------------------------------------------------------------------
       70000         2                                                              35
       14510     40022                                                              35
       70000     14510           0           1           1           0              35
          18                                                                        35
                            ***N     ***                                            35
  REF. HINKELMANN ET AL  KFK 1340                                                   35
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TEXT

```
      110023          20                                                                  36
       14510       14580       14590       32510       14511       21520                  36
       30270       31070       31020       30040       30050       30020                  36
       40022       31030       30010       32010       30030       30160                  36
       21530       21540                                                                  36
      110023       14510           0           1           1           0                  36
         180                                                                              36
                               ***NA 23***                                                36
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                               THE OTHER PARAMETERS FOLLOW (2).                           36
        CROSS SECTIONS: SGT,SGN,SGG CALCULATED FROM RESONANCE PARAMETER                   36
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           (1) S.J.FRIESENHAHN ET AL.WASHINGTON CONF. 1968 PP.695                         36
           (2) R.W.HOCKENBURY ET AL. PHYS.REV.178(1969)1746                               36
      1975: SCATTERING DATA REVISED ABOVE 4 MEV                                           36
            SGG REVISED BETWEEN 60 KEV AND 1 MEV                                          36
 B.GOEL TO BE PUBLISHED                                                                   36
-------------------------------------------------------------------------------------------
      920238          27                                                                  37
       14510       14560       34610       50160       50170       14580                  37
       14590       32510       34520       14570       14511       21520                  37
       30270       31070       30190       31020       30040       30050                  37
       30051       30020       40022       31030       30010       30160                  37
       30170       21530       21540                                                      37
      920238       14510           0           1           1           0                  37
          90                                                                              37
                               ***U 238***                                                37
 1975: EXTENSIVE REVISION OF DATA                                                         37
        RESOLVED RESONANCE PARAMETERS BASED ON MOXON EVALUATION                           37
        ( SPECIALIST MEETING SACLAY 1974)                                                 37
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        2. B. GOEL, H. KUESTERS AND F. WELLER SPECIALIST MEETING ON                       37
        INELASTIC SCATTERING HARWELL 1975                                                 37
        3. B.GOEL, F. WELLER TO BE PUBLISHED                                              37
-------------------------------------------------------------------------------------------
       10001           2                                                                  38
       14580       14590                                                                  38
       10001       14580           0           0           3           0                  38
           1                                                                              38
 1.00783E+00 1.00000E+00 5.00000E-01                                                      38
-------------------------------------------------------------------------------------------
      170000          17                                                                  39
       14510       14560       14590       14600       32510       14511                  39
       21520       30270       31070       31020       30040       30020                  39
       31030       30010       32010       30030       30160                              39
      170000       14510           0           1           1           0                  39
          18                                                                              39
                               ***CL   ***                                                39
 DATA ORIGINATES FROM UNC 5067 (1963)                                                     39
-------------------------------------------------------------------------------------------
      170035           2                                                                  40
       14580       14590                                                                  40
      170035       14580           0           0           3           0                  40
           1                                                                              40
 3.49689E+01 1.70000E+01 1.50000E+00                                                      40
-------------------------------------------------------------------------------------------
      170037           2                                                                  41
       14580       14590                                                                  41
      170037       14580           0           0           3           0                  41
           1                                                                              41
 3.69659E+01 1.70000E+01 1.50000E+00                                                      41
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TEXT

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      940240        24                                                                       42
       14510     32070     14560     32060     14580     14590                             42
       32510     34520     14570     14511     21520     30270                             42
       30190     31020     30040     30050     30020     40022                             42
       30010     30160     30170     21530     21540     21550                             42
      940240     14510         0         1         1         0                             42
          72                                                                               42
                           ***PU240***                                                     42
REFERENCES: M. CANER, S. YIFTAH  AI 143 (1972)                                             42
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F. FROEHNER TO BE PUBLISHED                                                                42
B. GOEL TO BE PUBLISHED                                                                    42
---------------------------------------------------------------------------------------------------
      940242        22                                                                       43
       14510     14560     14580     14590     32510     34520                             43
       14570     14511     21520     30270     30190     31020                             43
       30040     30050     30020     40022     30010     30160                             43
       30170     21530     21540     21550                                                 43
      940242     14510         0         1         1         0                             43
          36                                                                               43
                           ***PU242***                                                     43
REFERENCES: M. CANER, S. YIFTAH  AI 1243 (1972)                                            43
1975:   STORAGE OF POINTWISE DATA IN RESONANCE REGION                                      43
F. WELLER                                                                                  43
---------------------------------------------------------------------------------------------------
      940241        25                                                                       44
       14510     32070     14560     32060     14580     14590                             44
       32510     34520     14570     14511     21520     30270                             44
       30190     31020     30040     30050     30020     40022                             44
       30010     32010     30160     30170     21530     21540                             44
       21550                                                                               44
      940241     14510         0         1         1         0                             44
          54                                                                               44
                           ***PU241***                                                     44
REFERENCES: M. CANER, S. YIFTAH  AI 1243 (1972)                                            44
1975:   STORAGE OF POINTWISE DATA IN THE RESONANCE REGION                                  44
F. WELLER                                                                                  44
1976:   SGF, SGG, SGN REEVALUATED IN STATISTICAL RESONANCE REGION                          44
B. GOEL                                                                                    44
---------------------------------------------------------------------------------------------------
      924233        26                                                                       45
       14560     32060     14580     14590     44632     32510                             45
       34520     14511     21520     50053     50163     50173                             45
       30270     30190     31020     30040     30050     30051                             45
       30020     40022     30010     30160     30170     21530                             45
       21540     21550                                                                     45
      924233     14560         0         1         3         0                             45
           1                                                                               45
  2.53000E-02 3.21500E-07 7.47000E-07 1.67600E-06                                          45
---------------------------------------------------------------------------------------------------
      280059         8                                                                       46
       14580     14590     21520     31070     31020     30020                             46
       31030     30010                                                                     46
      280059     14580         0         0         3         0                             46
           1                                                                               46
  5.89340E+01 2.80000E+01-1.50000E+00                                                      46
---------------------------------------------------------------------------------------------------
      920237         9                                                                       47
       32070     30270     30190     31020     30040     30050                             47
       30020     30010     30030                                                         47
      920237     32070         0         1         1         0                             47
          51                                                                               47
  1.10000E+04 1.21200E+00 1.20000E+04 1.11830E+00 1.40000E+04 1.03130E+00                 47
  1.50000E+04 9.98150E-01 1.70000E+04 9.43820E-01 1.80000E+04 9.20900E-01                 47
  2.00000E+04 8.81910E-01 2.20000E+04 8.48750E-01 2.50000E+04 8.09620E-01                 47
  2.70000E+04 7.86500E-01 3.00000E+04 7.57330E-01 3.30000E+04 7.32230E-01                 47
  3.70000E+04 7.02850E-01 4.10000E+04 6.78880E-01 4.50000E+04 6.57490E-01                 47
  5.00000E+04 6.34310E-01 5.60000E+04 6.11800E-01 6.10000E+04 5.92550E-01                 47
  6.70000E+04 5.72630E-01 7.40000E+04 5.53350E-01 8.20000E+04 5.32650E-01                 47
  9.10000E+04 5.10610E-01 1.00000E+05 5.01390E-01 1.10000E+05 4.76060E-01                 47
  1.20000E+05 4.54290E-01 1.40000E+05 4.25000E-01 1.50000E+05 4.14930E-01                 47
  1.61000E+05 3.91430E-01 1.63000E+05 3.87910E-01 1.80000E+05 3.54650E-01                 47
  2.04000E+05 3.23360E-01 2.05000E+05 3.21480E-01 2.20000E+05 3.07580E-01                 47
  2.62000E+05 2.70270E-01 2.75000E+05 2.61330E-01 3.00000E+05 2.44160E-01                 47
  3.17000E+05 2.36500E-01 3.27000E+05 2.324[illegible]E-01 3.28000E+05 2.32140E-01        47
  3.68000E+05 2.17660E-01 4.10000E+05 2.06520E-01 4.34000E+05 1.99530E-01                 47
  4.84000E+05 1.89400E-01 5.10000E+05 1.85020E-01 5.43000E+05 1.77870E-01                 47
  5.53000E+05 1.77280E-01 5.57000E+05 1.76530E-01 6.10000E+05 1.62460E-01                 47
  6.35000E+05 1.56040E-01 6.70000E+05 1.58620E-01 7.00000E+05 1.61230E-01                 47
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TEXT

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      930237         24                                                      48
       32070      14560      32060      14580      14590      32510        48
       34520      14570      21520      30270      30190      31020        48
       30040      30050      30020      40022      30010      32010        48
       30030      30160      30170      21530      21540      21550        48
      930237      32070          0          1          1          0        48
         108                                                               48
2.00000E+02 5.82570E+02 3.00000E+02 5.82820E+02 4.00000E+02 5.84880E+02   48
5.00000E+02 5.85620E+02 6.00000E+02 5.88000E+02 7.00000E+02 5.82580E+02   48
8.00000E+02 5.88000E+02 9.00000E+02 5.75140E+02 1.00000E+03 5.67800E+02   48
2.00000E+03 6.30920E+02 3.00000E+03 5.99200E+02 4.00000E+03 5.09600E+02   48
5.00000E+03 4.51200E+02 6.00000E+03 4.09800E+02 7.00000E+03 3.78400E+02   48
8.00000E+03 3.54100E+02 9.00000E+03 3.34600E+02 1.00000E+04 3.18600E+02   48
2.00000E+04 2.18090E+02 3.00000E+04 1.89270E+02 3.33500E+04 1.82640E+02   48
4.00000E+04 1.65820E+02 5.00000E+04 1.37830E+02 5.97900E+04 1.29830E+02   48
7.00000E+04 1.06380E+02 7.63200E+04 9.40000E+01 8.00000E+04 8.51330E+01   48
9.00000E+04 6.97650E+01 1.00000E+05 5.78950E+01 1.03390E+05 5.70530E+01   48
1.30550E+05 3.89600E+01 1.59170E+05 2.85160E+01 1.91300E+05 2.18650E+01   48
2.00000E+05 2.02560E+01 2.26950E+05 1.70700E+01 2.68670E+05 1.33670E+01   48
2.82540E+05 1.23730E+01 3.06390E+05 9.65570E+00 3.29380E+05 6.34480E+00   48
3.33760E+05 5.98900E+00 3.59510E+05 4.22500E+00 3.70150E+05 3.61030E+00   48
3.72510E+05 3.51080E+00 3.97270E+05 2.59660E+00 4.00000E+05 2.51670E+00   48
4.39350E+05 1.55890E+00 4.54510E+05 1.31880E+00 4.61340E+05 1.22080E+00   48
4.86540E+05 9.37980E-01 4.99100E+05 8.31750E-01 5.00000E+05 8.25470E-01   48
5.16170E+05 7.23180E-01 5.47300E+05 5.71430E-01 5.50000E+05 5.60580E-01   48
6.50000E+05 2.97750E-01 7.00000E+05 2.30530E-01 7.50000E+05 1.95080E-01   48
8.00000E+05 1.61460E-01 8.50000E+05 1.41450E-01 9.00000E+05 1.23440E-01   48
9.50000E+05 1.12290E-01 1.00000E+06 9.84199E-02 1.10000E+06 8.53739E-02   48
1.20000E+06 7.26029E-02 1.30000E+06 6.42569E-02 1.40000E+06 5.67660E-02   48
1.50000E+06 5.15330E-02 1.60000E+06 4.63320E-02 1.70000E+06 4.20380E-02   48
1.80000E+06 3.79030E-02 1.90000E+06 3.63410E-02 2.00000E+06 3.43750E-02   48
2.20000E+06 2.84650E-02 2.40000E+06 2.46910E-02 2.60000E+06 2.22220E-02   48
2.80000E+06 2.04460E-02 3.00000E+06 1.88680E-02 3.50000E+06 1.55840E-02   48
4.00000E+06 1.34230E-02 4.50000E+06 1.15650E-02 5.00000E+06 1.02460E-02   48
5.20000E+06 9.53680E-03 5.40000E+06 9.48510E-03 5.60000E+06 8.59220E-03   48
5.80000E+06 7.73690E-03 6.00000E+06 7.33950E-03 6.30000E+06 6.21819E-03   48
6.50000E+06 5.35620E-03 6.78900E+06 4.79390E-03 7.00000E+06 4.22140E-03   48
7.30000E+06 4.11900E-03 7.60000E+06 3.58420E-03 8.00000E+06 3.52110E-03   48
8.50000E+06 3.04350E-03 9.00000E+06 2.57730E-03 9.50000E+06 2.56080E-03   48
1.00000E+07 2.55100E-03 1.05000E+07 2.12590E-03 1.10000E+07 2.13040E-03   48
1.15000E+07 2.14130E-03 1.20000E+07 1.71820E-03 1.23400E+07 1.71820E-03   48
1.25000E+07 1.71820E-03 1.30000E+07 1.71310E-03 1.35000E+07 1.70500E-03   48
1.40000E+07 1.69490E-03 1.45000E+07 1.25210E-03 1.50000E+07 1.23710E-03   48
```

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      904232         24                                                      49
       14510      14580      14590      32510      34520      14511        49
       21520      54523      50053      50163      50173      30270        49
       30190      31020      30040      30050      30051      30020        49
       40022      30010      30160      30170      21530      21540        49
      904232      14510          0          1          1          0        49
         927                                                               49
90-TH-232 B+W         EVAL-NOV66 WITTKOPF, ROY, AND LIVOLSI                49
BAW-317 (1970)        DIST-MAY74  REV-NOV74                                49
          *          *          *          *          *          *          49
FILE MODIFIED FOR ENDF/B VERSION-IV   O.OZER (BNL)  APR74        *         49
        1)INCLUDED YIELD DATA FROM FISS. PROD. TASK FORCE(JAN74)            49
          REVISED NOV-74                                                    49
        2)INCLUDED RAD. DECAY DATA FROM C.W.REICH-ANC     (FEB74)           49
        3)INCLUDED DELAYED NEUT. YIELDS FROM S.A.COX-ANL (DEC73)            49
        4)ADDED PROMPT NEUT. YIELDS BY CALCULATING MT=452-455               49
        5)EXTENDED CROSS SECTION DATA TO 20 MEV BY USING LLL                49
          RATIOS (15MEV/20 MEV)                                             49
        6)EXTENDED MF=4,MT=2 DATA BY REPEATING THE 15 MEV DIST.             49
          AT 20 MEV.                                                        49
        7)EXTENDED MF=5 AND REMAINING MF=4 DATA BY EXTRAPOLATION            49
          (CSEWG RECOMMENDATION DEC73)                                      49
         *          *          *          *          *          *          49
         MF=1,MT=454                                                        49
 FISSION PRODUCT YIELD DATA FOR ENDF/B-IV 1/74.      RECOMMENDED            49
 VALUES ARE GIVEN FROM THE YIELDS SUBCOMMITTEES OF THE DECAY HEAT           49
 TASK FORCE. MEMBERS OF THE SUBCOMMITTEES INCLUDE W.WALKER(CH),             49
 P.ALINE,N.DUDEY,R.LARSEN,W.MAECK,W.MCELROY,B.RIDER,T.ENGLAND(CH)           49
 A.WAHL AND K.WOLFSBERG. FINAL DIRECT YIELDS WERE GENERATED BY B.           49
 RIDER AS DESCRIBED IN NEDO-12154 REV.1 JAN.74. ENDF/B FILE PREP.           49
 WAS MADE BY R.SCHENTER 1/74. PEAK CHAIN YIELDS ARE GIVEN AS                49
    ELAB=5.00E+05 EV      A-YCHAIN(PERCENT)=                                49
  832.04, 843.72, 853.82, 866.09, 876.48, 886.85, 897.83, 907.96,           49
  917.10, 927.18, 937.75, 946.08, 955.53, 964.89, 974.12, 984.00,           49
  993.02,1322.66,1333.66,1344.87,1354.85,1365.12,1377.02,1386.91,           49
 1396.73,1407.91,1417.65,1426.64,1436.99,1448.22,1455.67,1464.85,           49
 1473.27,1482.11                                                            49
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TEXT

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        *          *          *          *          *          *                49
        MF=1,MT=455                                                            49
DELAYED NEUTRON DATA EVALUATION BY S.A.COX (ANL) (TO BE PUBL.)                 49
        *          *          *          *          *          *                49
        MF=1,MT=456                                                            49
PROMPT NEUTRON DATA GENERATED BY SUBTRACTING DELAYED YIELDS FROM               49
TOTAL.                                                                         49
        *          *          *          *          *          *                49
        MF=1,MT=457                                                            49
RADIOACTIVE DECAY DATA PREPARED BY C.W.REICH (ANC)  JAN74                      49
REFERENCES  Q(ALPHA)- 1973 REVISION OF WAPSTRA-GOVE MASS TABLE                 49
            HALF-LIFE-N.E. HOLDEN, CHART OF THE NUCLIDES (1973)                49
                       AND PRIVATE COMMUNICATION (JAN.,1974)                   49
            OTHER- M.R. SCHMORAK, NUCLEAR DATA B 4,NO.6,561(1966)              49
 NOTE  1. )E-ALPHA  = 4068. KEV.                                               49
          THIS VALUE INCLUDES, IN ADDITION TO THE KINETIC ENERGY               49
          OF THE ALPHA PARTICLE, THE RECOIL ENERGY OF THE                      49
          DAUGHTER NUCLEUS.                                                    49
       2. THE INTERNAL-CONVERSION COEFFICIENTS ARE THEORETICAL                 49
          VALUES.THE GAMMA-RAY INTENSITIES ARE DERIVED FROM THESE              49
          VALUES, WITH THE REQUIREMENT THAT THE TOTAL TRANSITION               49
          INTENSITY AGREE WITH THAT GIVEN BY THE ALPHA-PARTICLE                49
          BRANCHING DATA.                                                      49
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *     49
                                                                               49
 THORIUM-232       (B AND W)    WITTCOPF, ROY, AND LIVOLSI                     49
          *          *          *          *          *                        49
          DATA COMPILED NOV., 1966 AND MODIFIED MAY, 1969                      49
          EVALUATION DESCRIBED IN BABCOCK AND WILCOX REPORT,                   49
          BAW-317                                                              49
          *          *          *          *          *                        49
ENERGY RANGE (0.00001 TO 10 EV.                                                49
   TOTAL X/S ACCORDING TO MEMO FROM B.R. LEONARD TO CSEWG ON AUG.              49
   8, 1969.  A VALUE OF 10.15 B FOR THE POTENTIAL X/S WAS PROVID               49
   ED AS THE BEST FIT TO THE EXPERIMENTALLY MEASURED DATA.                     49
   THE 2200 M/SEC CAPTURE CROSS SECTION WAS  7.40 B, OF WHICH                  49
   6.96 B IS DUE TO A NEG. ENERGY LEVEL, 0.245 IS DUE TO THE                   49
   POSITIVE ENERGY LEVELS, AND 0.195 IS 1/V CONTRIBUTIONS.                     49
   ELASTIC SCATTERING X/S DERIVED AS THE DIFFERENCE BETWEEN                    49
   THE TOTAL AND THE CAPTURE X/S.                                              49
ENERGY RANGE (0.01 TO 50.0 KEV)                                                49
   BNL-325, 2ND ED. PROVEDED THE RECOMMENDED VALUES FOR ALL                    49
   RESOLVED RESONANCES UP TO 3.006 KEV. THE LAST GROUP OF                      49
   RESONANCES UP TO 3.931 KEV WERE OBTAINED FROM THE MEASUREMENT               49
   MADE BY GRAG, ET AL., PHYS. REV.134,B95(1964). ALL RESOLVED                 49
   RESONANCES WERE TAKEN AS S-WAVE.                                            49
   THE RANGE FROM 3.931 TO 50 KEV IS COVERED BY THE UNRESOLVED                 49
   RESONANCE REGION AND THE PARAMETERS ARE DESRIBED IN BAW-317.                49
   A BACKGROUND CROSS SECTION IS GIVEN IN FILE 3 FOR THE                       49
   CAPTURE X/S TO ACCOUNT FOR MISSED P-WAVE RESONANCES  IN THE                 49
   RESOLVED RESONANCE REGION.                                                  49
ENERGY RANGE (0.05 TO 15 MEV)                                                  49
   THE TOTAL X/S WAS TAKEN FROM THE DATA GIVEN IN BNL-325,                     49
   2ND ED. THE ELASTIC X/S WAS OBTAINED AS THE DIFFERENCE                      49
   BETWEEN THE TOTAL AND ALL NON-ELASTIC CROSS SECTIONS.                       49
   THE RADIATIVE CAPTURE X/S WAS TAKEN FROM THE DATA GIVEN IN                  49
   BNL-325, 2ND ED.  THE FISSION X/S WAS TAKEN FROM AN EVALUATION              49
   MADE BY DAVEY, N.S.E., 26,149(1966) UP TO 10 MEV AND FROM                   49
   BNL-325, 2ND ED. UP TO 15 MEV.                                              49
   THE NUMBER OF NEUTRONS PER FISSION IS IN AGREEMENT WITH H.                  49
   CONDE AND M. HOLMBERG, IAEA CONF.(1965) VOL.2, P61.                         49
   FOR SECONDARY ENERGY DISTRIBUTION  OF FISSION NEUTRONS, THE                 49
   TEMPERATURE IS IN AGREEMENT WITH THE WORK BY E.BARNARD ET AL.               49
   NUC. PHYS. 71,228(1965).                                                    49
   INELASTIC          THRESHOLD SET AT 50 KEV AS FROM A.B.SMITH                49
   PHYS.REV. 126,718(1962). ALL OTHER DISCRETE LEVELS WERE                     49
   OBTAINED FROM WORK OF N.P.GLASKOV, AT. ENERGY. 14,400(1963),                49
   R. BATCHELOR ET AL. NUC. PHYS. 65,236(1965), AND S.O. MOORE,                49
   BNL-818 (1963).                                                             49
   THE (N,2N) X/S WAS OBTAINED AS AN UNWEIGHTED AVERAGE THROUGH                49
   SEVERAL EXPERIMENTAL DATA SETS PUBLISHED BETWEEN 1964 AND 1956              49
   THE (N,3N) X/S WAS OBTINED FROM THE WORK OF M.H.TAGGART AND                 49
   H. GOODFELLOW, JNE 17,437(1963).                                            49
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14510	14580	14590	32510	34520	14570	50
21520	30270	30190	31020	30040	30050	50
30020	40022	30010	30160	30170	21530	50
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14590	32510	34520	14570	14511	21520	52
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30190	31020	30040	30050	30020	40022	53
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2.00000E+03	8.05290E+01	3.00000E+03	8.03570E+01	4.00000E+03	8.29170E+01	56
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4.29000E+04	6.58000E+01	5.00000E+04	5.96000E+01	6.00000E+04	5.44000E+01	56
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2.97000E+05	3.45160E+00	4.00000E+05	1.54410E+00	5.02000E+05	6.42500E-01	56
6.00000E+05	4.10650E-01	7.00000E+05	2.66010E-01	8.00000E+05	1.31580E-01	56
8.45000E+05	7.95660E-02	8.79000E+05	6.48000E-02	9.26000E+05	5.53130E-02	56
9.85000E+05	4.73650E-02	1.05600E+06	4.57720E-02	1.08300E+06	4.59990E-02	56
1.10900E+06	4.56250E-02	1.12800E+06	4.55110E-02	1.13200E+06	4.54830E-02	56
1.13300E+06	4.54830E-02	1.17000E+06	4.48320E-02	1.18000E+06	4.42090E-02	56
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1.30500E+06	4.01250E-02	1.35400E+06	3.83170E-02	1.37200E+06	3.76650E-02	56
1.45700E+06	3.50880E-02	1.48400E+06	3.44610E-02	1.50000E+06	3.38130E-02	56
1.60000E+06	3.09410E-02	1.70000E+06	2.70110E-02	1.80000E+06	2.38930E-02	56
1.90000E+06	2.16400E-02	2.00000E+06	1.91870E-02	2.20000E+06	1.60930E-02	56
2.40000E+06	1.36990E-02	2.60000E+06	1.19630E-02	2.80000E+06	1.03040E-02	56
3.00000E+06	8.67210E-03	3.50000E+06	6.50410E-03	4.00000E+06	4.87800E-03	56
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5.40000E+06	2.71000E-03	5.60000E+06	2.16800E-03	5.80000E+06	2.16800E-03	56
6.00000E+06	2.16800E-03	6.36500E+06	1.95310E-03	7.00000E+06	1.24950E-03	56
7.30000E+06	1.24950E-03	7.60000E+06	1.24950E-03	8.00000E+06	1.24950E-03	56
8.50000E+06	8.32990E-04	9.00000E+06	8.32990E-04	9.50000E+06	8.32990E-04	56
1.00000E+07	8.32990E-04	1.05000E+07	8.32990E-04	1.10000E+07	4.16490E-04	56
1.15000E+07	4.16490E-04	1.20200E+07	4.15800E-04	1.24000E+07	4.04040E-04	56
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