MEMORANDUM 4C-2/39

From: Hans Potters

Subject: Unsolved problems, TRANS 1001-1004

17th May 1973

1. We envisage sending from time to time photocopies of old memos containing remarks on TRANS tapes which have not been solved up to the present.

2. Centres are requested to answer in the usual way by putting their remarks on the attached sheets and returning a photocopy.

3. We are not in agreement with NDS that in all cases where independent variables are repeated a remark should be put in COMMENT. When we provide centres with a list of these cases we expect them to check it and notify us whether or not it is correct.

Fritz Frohner

Distribution:

Dr. V. Manokhin (5 copies)
Dr. S. Pearlstein (" ")
Dr. J. Schmidt (" ")

1001

4C-2/27

2/39

TABLE B

Tape	DSN	Independent variables repeated
1001	10009 002	.695333E 03, .867531E 03, .103969E 04, .121184E 04, .138397E 04 and all points beyond .146002E 04 of which several 3,4 and even 5 times repeated. Are they independant remeasurements ?
	10019 002	34. 70.
1002	~~10034 065~~	5.0000E-01, 6.0000E-01, 7.0000E-01, 8.0000E-01, 8.5000E-01, 9.0000E-01, 1.0000E+00 (3x), 1.1500E+00, 1.2000E-01, 1.2500E+00 a)
	066	8.5000E-01, and all values beyond 1.0400E-01 except 1.1000E+00 and 1.4500E+00
		1.3500E+00
	069	1.2500E+00, 1.5000E+00 (3x)
	070	1.2500E+00, 1.4000E+00, 1.5000E+00 (5x)
	071	1.5000E+00, (4x)
	072	1.5000E+00 (3x)
	073	1.5000E+00 (3x)
	074	5.327E+02, 5.587E+02, 5.757E+2,
	076	1.268E+03
1003	10027 007	29.72, 50.54
	008	123.69, 137.92 (3x)
	009	29.71, 45.74
	010	66.75, 104.72, 137.92
	014	16.24, 24.34, 89.77 and all values beyond 112.07
		134.65
	017	31.44, 39.90
	018	61.53
	019	16.87, 25.27, 76.81, 132.78, 139.66
	023	.676833, 1.118325, 1.348460
	10050 002	.596900, .597900, .598900, .969816
	003	1.488022
		.374080, 1.408995
	10071 002	.269600, 1.279017, 1.363046, 1.427068,
	10072 002	1.447090
1004	10068 002	Between .1000+01 and .1400+01 several repetitions due to a too course rounding off of the energy
	10069 002	
	10070 002	
	003	
	10177 002	
	~~10178 002~~	

~~a) Corrected on tape 100[illegible] [illegible] in Table C.~~

B. TRANS 1001

10017 006-013 ANALYSIS

The scattering cross-section is assumed to be constant (not close to a resonance) over the energy region measured (0.07-6.2 eV). This is why the slope does not give the scattering cross-section at 0.0253 eV but a kind of average over this energy region.

Further: the intercept of the line is not $\sigma_{n,\gamma}$ (at 2200 m/sec.) but $\sigma^{o}_{n,\gamma} * V_o$.

So subwork 006-009 should have the AV modifier in the ISO-QUANT and EN-MIN, EN-MAX in the DATA-table, while for subwork 010-013 the text in ANALYSIS should read V(0)*SIGMA(0) (N,GAMMA) instead of N,GAMMA C/S.

10019 003 ? ANALYSIS

It is not clear whether L = 1 is assumed for the 12.3 keV resonance only or for all resonances.

10030 004 RESID-NUC

Should be: (39-Y-90-M1).

A Half-life is missing (3.2 HR ?).

10031 Half-lives missing

010 A (5.5HR ?)

011 A (50.D ?)

10046 003, 007, 011, 016, 024, 026, 030 ISO-QUANT

A The RED function parameter code assumes an ℓ-value to be given which is missing (ℓ=0?).

10046 ? Missing data

In comparing entry 10046 with data in NEUDADA we found a preliminary data set from Wynchank, March 1969. The following data were not in 10046 :

1002

Appendix A

NEUDADA DATA REQUEST.

INDEX (+COMMENTS) TO REQUEST OF DATA DERIVE

NUCLIDE	QUANTITY	ENERGY (MEV) MIN	MAX	REFERENCE
~~0066 Eu152 σ(n,γ)~~		2.530E-08	2.530E-08	NP A71 316
				TITLE INVESTIGATION RATIOS
				AUTHOR (J.BACSO,J.CS
				INSTITUTE (3HUNDEB)
				EXP-YEAR (62)
				REFERENCE (J,AKS,5,(3-4) (J,NP,A71,316,
				SAMPLE (METAL) INDIU
				STANDARD (STANS) STANDA
				DETECTOR
				FACILITY (ACCEL) 800 KE GENERA
				N-SOURCE (SB-BE) SB-BE PROVID
				(D-D) H-2(D,N) 3.1 MEV
				(D-T) H-3(D,N)
				METHOD (ACTIV) ACTIVA
				DETECTOR (GMC,LONGC) MI LOW ENERGY GAM CALIBRATED WIT
				PART-DET (B-) DECAY RET
				ERR-ANALYS NO INFORMATION
				STATUS (PUBL) DATA FRO
				HISTORY (7101067) PREVI (6707276) COMP

10046

Eu151	Resonance Energy	4.610E-07	4.610E-07	WYNCHANK 69 M WYNCHANK. PRELIMINARY. ENE BELOW 50 EV, AND VARIES SH
Eu151	Γ	6.390E-05	6.546E-05	WYNCHANK 69 M
Eu151	2g*Γ(n)	6.390E-05	6.546E-05	WYNCHANK 69 M
Eu151	2g*Γ°(n,l=0)	6.390E-05	6.546E-05	WYNCHANK 69 M
Eu153	Resonance Energy	4.570E-07	4.570E-07	WYNCHANK 69 M WYNCHANK. PRELIMINARY. ENE BELOW 50 EV, AND VARIES SH

AND BEEN CORRECTED

DERIVED FROM CCDN FILES

RENCE	DATE	LAB S STAN	METHOD	DATA POINTS	REQ ACC NUMBER
	16	63 DER	Ratio Activation	1	U00001

T GATION OF THE ENERGY DEPENDANCE OF ISOMERIC
S
C SO,J.CSIKAI,A.DAROCZY)
ER)

S,5,(3-4),6312) DETAILS IN RUSSIAN, TABLES
,41,316,6303) EXPERIMENTAL DESCRIPTION, NO DATA
) INDIUM FOIL OF 153 MG/SQCM THICK
S) STANDARD UO2SO4 SOURCE USED TO CALIBRATE
TOR
A) 800 KEV CASCADE GENERATOR AND 100 KEV NEUTRON
ENERATOR
E) SR-BE SOURCE IN SCATTERING FREE ENVIRONMENT
PROVIDED 24 KEV NEUTRONS
H-2(D,N)HE-3 REACTION PRODUCED NEUTRONS OF
3.1 MEV
H-3(D,N)HE-4 REACTION PRODUCED 14.67MEV NEUTRONS
V) ACTIVATION
LONGC) MICA END-WINDOW GM COUNTER, SENSITIVITY FOR
NERGY GAMMAS LESS THAN 0.4 PERCENT. LONG COUNTER
RATED WITH PO-BE SOURCE WAS USED AS FLUX MONITOR
DECAY BETA
FORMATION
) DATA FROM ATOMKI KOZL. SUPPL. 5,(3-4) 12/63
06T) PREVIOUSLY DASTAR-00167
27C) ~~COMPILED INTO DASTAR~~

New Comment attached to old data

ANK 69	Mar69	COL		1	U00002
INARY. ENERGY UNCERTAINTY IS LESS THAN 0.01 EV					
) VARIES SMOOTHLY FROM 0.01 TO 0.2 EV ABOVE 50 EV.					
ANK 69	Mar69	COL	AreaAnalysis	2	U00003
ANK 69	Mar69	COL	AreaAnalysis	2	U00004
ANK 69	Mar69	COL	AreaAnalysis	2	U00005
ANK 69	Mar69	COL		1	U00006
INARY. ENERGY UNCERTAINTY IS LESS THAN 0.01 EV					
VARIES SMOOTHLY FROM 0.01 TO 0.2 EV ABOVE 50EV.					

1004b

F1002

Appendix A 22

REQUEST OF DATA FROM CCDN FILES

720321

045 103 = NP 41 376 J 63 DEB Ratio

U00001 ENERGY (MEV) THERMAL
25.3 -9

063 151 = WYNCHANK 69 W 69C COL

U00002 ENERGY (MEV)
461. -9

063 151 = WYNCHANK 69 W 69C COL

U00003 ENERGY (MEV)
63.9 -6
65.46 -6

063 151 = WYNCHANK 69 W 69C COL

U00004 ENERGY (MEV)
63.9 -6
65.46 -6

063 151 = WYNCHANK 69 W 69C COL

U00005 ENERGY (MEV)
63.9 -6
65.46 -6

063 153 = WYNCHANK 69 W 69C COL

U00006 ENERGY (MEV)
457. -9

1002

A 22 page 2

2x

Activation σ(n,γ)

11.53 +0

Resonance Energy

0.461 +0

AreaAnalysis Γ

		ERROR (ABS) *
100.	+0	10.
103.	+0	10.

AreaAnalysis 2g*Γ(n)

		ERROR (ABS) *
4.	+0	0.8
2.5	+0	0.4

10046

AreaAnalysis 2g*Γ°(n,l=0)

0.5 +0
0.308 +0

Resonance Energy

0.457 +0

1002

Additional Comments by Hans Lemmel

TRANS 1002.

Entry 1.0034:

please check if correct.

In subentry .002 the incident neutron-energy is repeated in 8 pairs. The same duplication of incident energy occurs in the relevant subentries for the Legendre-coefficients, e.g. subentries .007/.008, .017/.018 etc. ~~If these duplications are correct, the reason should be given somewhere.~~ We do not understand why the subentries for the Legendre-coefficients were not arranged by coeff.-nr. instead of incident energy; this would have reduced the number of subentries from 62 to 5. The given arrangement is, however, correct. Subentry .064 has a wrong isoquant!!

Entry 1.0036:

Isoquant does not conform with date table and title.

Entry 1.0038.:

Presumably the quantity in all entries should be:

SEM,DA,PAR

and the data-units should be:

write right MB/SR

MB/SR/KEV

Entry 1.0052.:

In subentries 18 - 37 the data-headings EN and EN-ERR should most likely be changed to EN-MIN and EN-MAX

Entry 1.0084.:

The Isoquant ratio should be in another pair of brackets:

((-)/(-))

(Refer EXFOR Manual, page D.2.7)

Entry 1.0092.002

The quantity-code should presumably be MR,,AV. This should be proposed to be added to dictionary 14.

Eu^{151} Resonance energy 0.461 eV
Resonance parameters 63.9 and 65.46 eV
Eu^{153} Resonance energy 0.457 eV

A retrieval from NEUDADA is added as an appendix (A).

Please state whether we have to delete these data or whether they have been forgotten.

10046 002-003 ? Differences

Another result of the comparison was that the values for the 78.05 eV resonances are maximum values so should be entered under a column headed DATA-MAX. Is this still valid?

C. TRANS 1002

10034 003-064 STANDARD drop code

~~The modifier RS denotes a ratio; so STANDARD is irrelevant and has to be dropped. If the free text is too important to leave out, enter it under COMMENT.~~ Symptom of compulsorialitis?

10052 012 ? ISO-QUANT

A Very probably RED should be entered in the Function field. We assumed (ℓ=0?).

023 ? COMMON

A This is the only case where COMMON is missing for the ISO-QUANT (...,D). We assumed (ℓ=0?).

10077 001 STANDARD

For spin values STANDARD is irrelevant. Free text can go under COMMENT.

D. TRANS 1003

10100-001 SAMPLE

U(3)O(2).

004 STANDARD

Can be left out.

TABLE B

4%

Tape	DSN	Independant variables repeated
~~1003~~	10009 002	.695333E 03, .867531E 03, .103969E 04, .121784E 04, .138397E 04 and all points beyond .146002E 04 of which several 3,4 and even 5 times repeated. Are the independant remeasurements ?
	10079 002	34. 70.
1002	10084 065	5.0000E-01, 6.0000E-01, 7.0000E-01, a) 8.0000E-01, 8.5000E-01, 9.0000E-01, 1.0000E+00 (3x), 1.1500E+00, 1.2000E-01, 1.2500E+00
	066	8.5000E-01, and all values beyond 1.0400E-01 except 1.1000E+00 and 1.4500E+00
	069	1.3500E+00
	070	1.2500E+00, 1.5000E+00 (3x)
	071	1.2500E+00, 1.4000E+00, 1.5000E+00 (5x)
	072	1.5000E+00, (4x)
	073	1.5000E+00 (3x)
	074	1.5000E+00 (3x)
	076	5.327E+02, 5.587E+02, 5.757E+2, 1.268E+03
~~1003~~	10082 001	29.72, 50.54
	008	123.69, 137.92 (3x)
	009	29.71, 45.74
	010	66.75, 104.72, 137.92
	014	16.24, 24.34, 89.77 and all values beyond 112.07
	017	134.65
	018	31.44, 39.90
	019	61.53
	023	16.87, 25.27, 76.81, 132.78, 139.66
	10050 002	.676833, 1.118325, 1.348460
	003	.596900, .597900, .598900, .969816 1.488022
	10071 002	.374080, 1.408995
	10072 002	.269600, 1.279017, 1.363046, 1.427060, 1.447090
1004	10068 002	Between .1000+01 and .1400+01 several repetitions due to a too course rounding off of the energy
	10069 002	
	10070 002	
	003	
	10177 002	
	10178 002	

a) Corrected on tape 1006 ! See remark in Table C.

TABLE B

Tape	DSN	Independent variables repeated
1001	10009 002	.695333E-03, .867531E-00, .103969E 04, .121184E 04, .138397E 04 and all points beyond .146002E 04 of which several 3,4 and even 5 times repeated. Are they independant remeasurements ?
	10019 002	34. 70.
002	10084 065	5.0000E-01, 6.0000E-01, 7.0000E-01, a) 8.0000E-01, 8.5000E-01, 9.0000E-01, 1.0000E+00 (3x), 1.1500E+00, 1.2000E-01, 1.2500E+00
	066	8.5000E-01, and all values beyond 1.0400E-01 except 1.1000E+00 and 1.4500E+00
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	070	1.2500E+00, 1.5000E+00 (3x)
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1004	10068 002	Between .1000+01 and .1400+01 several repetitions due to a too course rounding off of the energy
	10069 002	
	10070 002	
	003	
	10177 002	
	10178 002	

Continued on tape 1005. See remark in Table C

In many of the MF6SC-entries some energy or angle values of the data given are duplicated. In general this may be correct and resulting from merging data of different runs. If so, this should preferably be explained somewhere in the BIB-section. If it is not explained, it looks very much like the frequently occurring mistake that a card was corrected without taking out the old card, and this impression must be avoided.

5. In many entries a title is missing. This is disturbing because without a title it is often rather tedious to find out what the entry contains. Also when no published reference is available, a title is desirable.

B. TRANS 1003

1. Entry 1.0027.

a. In subentries 015-025 the quantity should probably be INL,DA,PAR instead of INL,DA because a level-energy is indicated. Only if this level is the only one which can be excited at this energy, the quantity INL,DA would be correct; but a comment would be required for clarification. The same applies to subentry 025, where the quantity is perhaps INL,,PAR instead of INL.

b. In subentry 015 the secondary-energy is given under the heading E-LVL, whereas the same energy is given in the following subentries under the heading E. What is correct? Explanation may anyway be desirable under "EN-SEC".

c. In subentry 025 the isotope given is 6-C-0. Should it not be 6-C-12 as in subentries 015-023?

2. Entry 1.0032.

a. In subentry 001 the standard-codes are wrong.

b. Under STATUS the indication is missing where the data were taken from, e.g. LA-4108 or a private communication.

c. In subentry 003 the column-heading "EN-RES" should be replaced by "DATA", since no table without a column-heading "DATA" (or "RATIO") is possible.

d. The isotope in subentry 004 should probably be 94-PU-238 instead of 94-PU-239.

3. Entry 1.0046.

a. In subentries 009 and 012 line 4, it should read MILLI-EV instead of MV.

b. In subentries 009 and 010 the column-heading "EN-RES" should be replaced by "DATA".

c. In subentry 025 the exponent E-4 is missing in the data.

4. Entry 1.0100.

a. In subentry 002 the normalisation-energy is missing and the standard cross-section value should preferably be entered in retrievable form.

Eu^{151} Resonance energy 0.461 eV

Resonance parameters 63.9 and 65.46 eV

Eu^{153} Resonance energy 0.457 eV

A retrieval from NEUDADA is added as an appendix (A).

Please state whether we have to delete these data or whether they have been forgotten.

10046 002-003 ? Differences

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C. TRANS 1002

10034 003-064 STANDARD

The modifier RS denotes a ratio; so STANDARD is irrelevant and has to be dropped. If the free text is too important to leave out, enter it under COMMENT. Symptom of compulsorialitis?

10052 012 ? ISO-QUANT

A Very probably RED should be entered in the Function field. We assumed (λ=0?).

023 ? COMMON

A This is the only case where COMMON is missing for the ISO-QUANT (...,D). We assumed (λ=0?).

10077 001 STANDARD

For spin values STANDARD is irrelevant. Free text can go under COMMENT.

D. TRANS 1003

10100 001 SAMPLE

U(3)O(2).

004 STANDARD

Can be left out.

1004

4C-2727

4*

TABLE B

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		072	1.5000E+00, (4x)
		073	1.5000E+00 (3x)
		074	1.5000E+00 (3x)
		076	5.327E+02, 5.587E+02, 5.757E+2, 1.268E+03
			29.72, 50.54
1003	10027	007	123.69, 137.92 (3x)
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		014	134.65
		017	31.44, 39.90
		018	61.53
		019	16.87, 25.27, 76.81, 132.78, 139.66
		023	.676833, 1.118325, 1.348460
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	10072	002	
1004	10068	002	Between .1000+01 and .1400+01 several repetitions due to a too course rounding off of the energy
	10069	002	
	10070	002	
		003	
	10177	002	
	10178	002	

a) Corrected on tape 1004 See remarks in Table C.