Nuclear Data relevant to CRP which were found to be missing in EXFOR

I. Spectrum Averaged Cross Sections (or ratios) found to be missing in EXFOR

Reaction	Sigma or Ratio	Facility Lab	Reference	EXFOR
Fission Reactor Spectrum averaged Cross Section				
^{55}Fe(n,α)^{53}Cr	9 ± 4 mb	HFIR ORNL	L. Greenwood et al. **JNM 155-157(1988)1335**	compiled in EXFOR Entry14376.002 (Nov 2013)
^{55}Fe(n,γ)^{56}Fe	13.2 ± 2.1 b		H. Liu, M. Abdou, L. Greenwood **FED 88(2013)2860**	

II. Experimental Neutron Kerma Factors K_f found to be missing in EXFOR

At the moment EXFOR contains the measured and published K_f data from following authors:

- U. Schrewe et al. Entry 22507 with results from paper presented at ND-1997 Trieste. However the author' data were wrongly converted into fGy*m^2 units ! Likely these data have to be superseded by data published in Phys. Med. Biol. 45, 651 (2000);
- S. Benck et al. Entry 22811 (Al) and 22807.45 (Si),
- E. Raeymackers et al. Entry 22942 (Bi and U, partial K_f),
- M.A. Lone et al. Entry D0592.003 Kerma-rates in Air at 125 cm from Be(d,xn) source (compiled as MISC).

Following data are missed in EXFOR (the list is believed to be close to completeness):

Target Reaction	Kerma Factor	Source Lab	Reference	EXFOR
C(n,tot) Mg(n,tot) Fe(n,tot)	2.19 ± 0.18 1.22 ± 0.03 0.479 ± 0.22 fGy m^2 at 14.7 MeV	D-T Univ. of Kansas	C. Wuu, and L. Milavickas, "Determination of the Kerma Factors in Tissue-equivalent Plastic. C, Mg, and Fe for 14.7 MeV Neutrons," **Med. Phys. 14(6), 1007 (1987)**	has to be compiled in EXFOR
C(n,tot) Mg(n,tot) Fe(n,tot)	2.25 ± 0.49 1.52 ± 0.50 0.59 ± 0.23 10^{-9} rad cm^2	D-T 15.0 MeV LLNL	E. Goldberg, D.R. Slaughter and R.H. Howell, Experimental Determination of Kerma Factors at E ≈ 15 MeV, **LLL Report UCID-17789, 1978**	has to be compiled in EXFOR

C(n,tot)	0.178 ± 0.11 10^{-8} cGy cm^2 at 14.1 MeV 2.92 ± 0.22 (at 17.8 MeV) 3.55 ± 0.28 (at 19.8 MeV) fGy m^2	RTNS-I 14.1, 15, 17.9 MeV LLNL	P.M. DeLuca, Jr., H.H. Barschall, R.C. Haight, and J.C. McDonald, ''Kerma factor of carbon for 14.1 MeV neutrons', **Radiation Research 100, 78–86 (1984)** P.M. DeLuca, Jr., H.H. Barschall, R.C. Haight, and J.C. McDonald, ''Measured neutron carbon kerma factors from 14.1 MeV to 18 MeV,'' *Proc. of 5th Symp. Neutron Dosim., v I:* Luxembourg, 1985, **No. EUR 9762 EN, pp. 193–200**. P.M. DeLuca, Jr., H.H. Barschall, M. Burhoe, and R.C. Haight, ''Carbon kerma factor for 18- and 20-MeV neutrons,'' **Nucl. Sci. Eng. 94 (1986) 192-198**	has to be compiled in EXFOR has to be compiled in EXFOR
O, Al, Si	E = 15, 17.5, 18.1, 19.1 MeV	RTNS-I 14.1, 15, 17.9 MeV LLNL	P.M. DeLuca, H.H. Barschall, H.H. Sun, R.C. Haight, 'Kerma factor of Oxygen Aluminium and Silicon for 15 and 20 MeV Neutrons **Radiat. Protect. Dosimetry 23 (1988) 27**	has to be compiled in EXFOR
C	1.84 ± 0.19 fGy m^2 E = 14.1 MeV	D-T LLNL	R.C. Haight, S.M. Grimes et al. **NSE 87 (1984) 41**	has to be added to 12899
H at C, N,O	E = 25.8, 50.0, 63.1 MeV E = 27.4, 39.7 60.7 MeV	^{7}Li(p,n) Crocker Nucl. Lab. Uni of CA	J.L. Romero, F.P. Brady, and T.S. Subramanian, ''Neutron induced charged particle spectra and kerma from 25 to 60 MeV,'' **Santa Fe - 1985, v. 1, pp. 687–699**	has to be compiled in EXFOR
C, O, Si C, Mg, Fe	E = 18, 23, 25 MeV E = 18, 23, 25 MeV (Data on Graph)	T(d,n) Uni of Wisconsin	C.L. Hartmann, P.M. DeLuca, Jr., and D.W. Pearson, 'Measurement of neutron kerma factors in C, O, and Si at 18, 23, and 25 MeV,' **Radiat. Protect. Dosim. 44, 25 (1992)** C.L. Hartmann, P.M. DeLuca Jr., D.W. Pearson, 'Measurement of C, Mg and Fe Kerma Factors and the ^{19}F(n,2n)^{18}F Cross Section for 18 to 27 MeV Neutrons' **ND-1991, Jülich, pp. 589-591** C.L. Hartmann, Measurements of Neutron Kerma Factors at 18, 23 and 25 MeV, **Ph.D. Thesis, University of Wisconsin, Madison, 1991**	has to be compiled in EXFOR
Mg, Si, Fe O	E = 25 to 85 MeV E = 34 to 66 MeV	WNR by ToF LANL and PSI	W.D. Newhauser, "Neutron Kerma Factor Measurements in the 25 MeV to 85 MeV Neutron Energy Range", **Ph.D. Thesis, University of Wisconsin, Madison, 1995 here** **Abstract: Medical Physics 22(1995)2128**	has to be compiled in EXFOR
C total and partial	E = 42.5, 62.7, 72.8 MeV	Cyclotron Li(p,n) Louvain-la-Neuve	I. Slypen, V. Corcalciuc, and J.P. Meulders, 'Kerma values deduced from neutron-induced charged-particle spectra of carbon from 40-MeV to 75-MeV' **Phys. in Med. and Biol. 40, 73–82 (1995)** I. Slypen, S. Benck, J.P. Meulders, V.	has to be compiled in EXFOR

C total and partial	E = 26.5 - 72.8 MeV		Corcalciuc, 'Experimental partial and total kerma coefficients for carbon deduced from microscopic cross sections at incident neutron energies below 75 MeV" **Phys. in Med. and Biol. 45 (2000) 577**	To be compiled in EXFOR
H, C, O, N, A-150, TE-M, TE-P, H_2O, ICRU muscle H	E = 3.0 to 72.8 MeV E = 29.0 to 72.8 MeV	Cyclotron Li(p,n) Louvain-la-Neuve	J.P. Meulders, S. Benck, I. Slypen, V. Corcalciuc, 'Experimental kerma coefficients of biologically important materials at neutron energies below 75 MeV', **Medical Physics 27, 2541 (2000)** V. Corcalciuc, S. Benck, R. Malu, J.P. Meulders, I. Slypen, "Experimental hydrogen kerma factors for incident neutron energies from 25 to 75 MeV, **Phys. in Med. and Biology 44(1999)719**	has to be compiled in EXFOR has to be compiled in EXFOR
$^{12}C(n,n'3\alpha)$	E = 11-35 MeV	$^{9}Be(d,n)$ Louvain-la-Neuve	B. Antolkovic, L. Slaus and D. Plenkovic, **"**Experimental Determination of the Kerma Factors for the Reaction $^{12}C(n,n'3a)$ at En = 10-35 MeV", **Radiation Research 97(1984)253**	has to be compiled in EXFOR
$^{12}C(n,n'3\alpha)$	E = 11.9 -19.0 MeV	D(d,n) T(d,n) PTB	B. Antolkovic, G. Dietzes and H.Klein, "Secondary Alpha Particle Spectra and partial Kerma Factors of the reaction n+ ^{12}C -> n + 3α", **Radiation Protect. Dosimetry 44(1992)31**	has to be compiled in EXFOR
C, N, O, Mg, Al, Si, Fe, Zr, AlN, Al_2O3, $Si0_2$, A-150 C and A-150 plastic	E = 5, 8, 15, 17, 34, 44, 66 MeV E = 26.3, 37.8 MeV	D(d,n) T(d,n) E=5-17MeV at PTB $^{9}Be(p,xn)$ E=34-66MeV at PSI $^{9}Be(p,xn)$ PSI, Switzerland	U.J. Schrewe, W.D. Newhauser, H.J. Brede, P.M. DeLuca, "Experimental kerma coefficients and dose distributions of C, N, O, Mg, Al, Si, Fe, Zr, A-150 plastic, Al_2O_3, AlN, SiO_2 and ZrO_2 for neutron energies up to 66 MeV", **Phys. Med. Biol. 45, 651 (2000)** H. Schuhmacher, H.J. Brede, R. Henneck, A. Kunz, H.G. Menzel, J.P. Meulders, P. Pihet, U.J. Schrewe, 'Measurement of neutron kerma factors for carbon and A-150 plastic at neutron energies of 26.3 and 37.8 MeV' **Phys. Med. Biol. 37, 1265–1281 (1992)** U.J. Schrewe, H.J. Brede et al. 'Determination of Kerma Factors for A-150 plastic and Carbon for neutron energies above 20 MeV' **ND-1991, Jülich, p. 586-594**	has to be compiled in EXFOR has to be compiled in EXFOR
Mg Al C	E = 13.9, 15.0, 19.0 MeV E = 13.9, 15.0, 17.0, 19.0MeV 2.35 ± 0.21 2.46 ± 0.24 fGy m^2	T(d,n) at PTB 15 MeV 17 MeV	G. Buhler, H.G. Menzel, H. Schuhmacher, 'Neutron kerma factors for magnesium and aluminium measured with low-pressure proportional counters' **Phys. Med. Biol. 31 (1986) 601** G. Buhler, H.G. Mentzel, H. Schuhmacher, S. Guldbakke, 5th Symp Neutr Dos, Munich, EUR-9762, p. 309 (1985)	has to be compiled in EXFOR

C, A-150	E = 13.9-20 MeV	T(d,n) PTB Germany	P. Pihet, S. Guldbakke, H.G. Menzel and H. Schuhmacher, 'Measurement of kerma factors for carbon and A-150 plastic: neutron energies from 13.9 to 20.0 MeV' **Phys. Med. Biol. 37, 1957 (1992)**	has to be compiled in EXFOR
N, O, Ca	E = 18-26 MeV	?? Ohio Univ.	M.S. Islam, R.W. Finlay, J.S. Petler, J. Rapaport, R. Alarcon and J. Wierzbicki, 'Neutron scattering cross sections and partial kerma values for oxygen, nitrogen and calcium at $18 < E_n < 60$ MeV' **Phys. Med. Biol. 33, 315 (1988)**	has to be compiled in EXFOR
C	1.8 ± 0.16 fGy m^2 E = 14.6 MeV	T(d,n) Pacific Northwest Lab	J.C. McDonald, ''Calorimetric measurements for the carbon kerma factor for 14.6-MeV neutrons,'' **Radiation Research 109 (1987) 28–35**	has to be compiled in EXFOR
?	?.? ± 0.?? fGy m^2 E = ?? MeV	???	L.S. August, P. Shapiro, R. B. Theus, Cross Sections and Yields for High Energy Neutron Source Reactions. **National Bureau of Standards Report NBSIR 77-1279, pp. 31-34, 1977**	???
C total and partial k_f C, O	E = 96 MeV E = 95 MeV	^{7}Li(p,n) TSL Uppsala.	B.E. Bergenwall, A. Atac and S. Kullander, 'Experimental kerma coefficients for carbon deduced from microscopic cross sections at 96 MeV incident neutron energy", **Phys. Med. Biol. 49, 4523 (2004)** P. Mermod, J. Blomgren, C. Johansson, A. Ohrn, M. Osterlund, S. Pomp et al. "95 MeV neutron scattering on hydrogen, deuterium, carbon, and oxygen", **Phys. Rev. C 74, 054002 (2006)**	has to be compiled in EXFOR has to be added to 23030
C elastic and ineal k_f	E = 16.5 – 22 MeV	T(d,n) gas target University Uppsala.	N. Olsson, B. Trostell, E. Ramstroem, "Cross sections and partial KERMA factors for elastic and inelastic neutron scattering from Carbon in the energy range 16.5 - 22.0 MEV", **Int. Conf. Nuclear Data for Sci. and Techn., Mito, 1988, 1045**	has to be added to 22098

Comments

Reference highlighted in Rot means that this article is not available in NDS.

Units and inter-conversion:

Kerma Factor Units: fGy*m^2 = 10^{+15} J/kg m^2 (**SI base units**)

rad cm^2 = erg/g cm^2 (**CGS base units**)

Conversion: 1 fGy*m^2 = 10^{+15} $10^{-7}/10^{+3}$ 10^{+4} = 10^{+9} rad cm^2

1 cGy = 0.01 Gy = 1 rad or 1 cGy cm^2 = 10^{-6} Gy m^2