

Appendix Table 2. Abundance of the nuclides (atoms/10⁶ Si), compiled by Anders and Grevesse (1989)

Z	A	Atom %	Process	Abund.	Z	A	Atom %	Process	Abund.
1 H	1	99.9966		2.79E10	22 Ti	47	7.3	Ex	175
	2	0.0034	U	9.49E5		48	73.8	Ex	1771
2 He	3	0.0142	U, h?	3.86E5	49	5.5	Ex	132	
	4	99.9858	U, h	2.72E9	50	5.4	Eq	130	
3 Li	6	7.5	X	4.28	23 V	50	0.25	Ex, Eq	0.732
	7	92.5	U, x, h	52.82		51	99.75	Ex	292
4 Be	9	100	X	0.73	24 Cr	50	4.345	Ex	587
	10	19.9	X	4.22		52	83.789	Ex	1.131E4
5 B	11	80.1	X	16.98	53	9.501	Ex	1283	
	12	98.9	He	9.99E6	54	2.365	Eq	319	
6 C	13	1.1	H, N	1.11E5	25 Mn	55	100	Ex, Eq	9550
	14	99.634	H	3.12E6		26 Fe	54	5.8	Ex
7 N	15	0.366	H, N	1.15E4	56		91.72	Ex, Eq	8.25E5
	8 O	16	99.762	He	2.37E7	57	2.2	Eq, Ex	1.98E4
17		0.038	N, H	9.04E3	58	0.28	He,Eq,C	2.52E3	
9 F	18	0.2	He, N	4.76E4	27 Co	59	100	Eq, C	2250
	19	100	N	843		28 Ni	58	68.27	Eq, Ex
10 Ne	20	92.99	C	3.2E6	60		26.1	Eq	1.29E4
	21	0.226	C, Ex	7.77E3	61	1.13	Eq,Ex,C	557	
11 Na	22	6.79	He, N	2.34E5	62	3.59	Eq,Ex,O	1770	
	23	100	C,Ne,Ex	5.74E4	64	0.91	Ex	449	
12 Mg	24	78.99	N, Ex	8.48E5	29 Cu	63	69.17	Ex, C	361
	25	10	Ne,Ex,C	1.07E5		65	30.83	Ex	161
13 Al	26	11.01	NE,Ex,C	1.18E5	30 Zn	64	48.63	Ex, Eq	613
	27	100	Ne, Ex	8.49E4		66	27.9	Eq	352
14 Si	28	92.23	O, Ex	9.22E5	67	4.1	Eq, S	51.7	
	29	4.67	Ne, Ex	4.67E4	68	18.75	Eq, S	236	
15 P	30	3.1	Ne, Ex	3.1E4	70	0.62	Eq, S	7.8	
	31	100	Ne, Ex	1.04E4	31 Ga	69	60.108	S, e, r	22.7
16 S	32	95.02	O, Ex	4.89E5		71	39.892	S, e, r	15.1
	33	0.75	Ex	3.86E3	32 Ge	70	20.5	S, e	24.4
34	4.21	O, Ex	2.17E4	72		27.4	S, e, r	32.6	
17 Cl	36	0.02	Ex,Ne,S	1.03E2	73	7.8	e, s, r	9.28	
	35	75.77	Ex	2860	74	36.5	e, s, r	43.4	
18 Ar	37	24.23	Ex, C, S	913	76	7.8	Eq	9.28	
	36	84.2	Ex	8.5E4	33 As	75	100	R, s	6.56
19 K	38	15.8	O, Ex	1.6E4		34 Se	74	0.88	P
	40		S, Ne	26	76		9	S, p	5.6
20 Ca	40			25±14	77	7.6	R, s	4.7	
	39	93.2581	Ex	3516	78	23.6	R, s	14.7	
21 Sc	40	0.01167	S,Ex,Ne	0.44	80	49.7	R, s	30.9	
	40			5.48	82	9.2	R	5.7	
22 Ti	41	6.7302	Ex	253.7	35 Br	79	50.69	R, s	5.98
	40	96.941	Ex	5.92E4		81	49.31	R, s	5.82
23 V	42	0.647	Ex, O	395	36 Kr	78	0.339	P	0.153
	43	0.135	Ex, C, S	82.5		80	2.22	S, p	0.999
24 Cr	44	2.086	Ex, S	1275	82	11.45	S	5.15	
	46	0.004	Ex,C,Ne	2.4	83	11.47	R, s	5.16	
25 Mn	48	0.187	Eq, Ex	114	84	57.11	R, S	25.7	
	45	100	Ex,Ne,Eq	34.2	86	17.42	S, r	7.84	
26 Fe	46	8	Ex	192	37 Rb	85	72.165	R, s	5.12

Z	A	Atom %	Process	Abund.	Z	A	Atom %	Process	Abund.
37 Rb	87	27.835	S	1.97	50 Sn	117	7.672	R, S	0.293
	87			2.11		118	24.217	S, r	0.925
38 Sr	84	0.56	P	0.132		119	8.587	S, R	0.328
	86	9.86	S	2.32		120	32.596	S, R	1.245
	87	7	S	1.64		122	4.632	R	0.177
	87			1.51		124	5.787	R	0.221
	88	82.58	S, r	19.41	51 Sb	121	57.362	R, s	0.177
39 Y	89	100	S	4.64		123	42.638	R	0.132
40 Zr	90	51.45	S	5.87	52 Te	120	0.09	P	0.0043
	91	11.22	S	1.28		122	2.57	S	0.124
	92	17.15	S	1.96		123	0.89	S	0.0428
	94	17.38	S	1.98		124	4.76	S	0.229
	96	2.8	R	0.32		125	7.1	R, s	0.342
41 Nb	93	100	S	0.698		126	18.89	R, S	0.909
42 Mo	92	14.84	P	0.378		128	31.73	R	1.526
	94	9.25	P	0.236		130	33.97	R	1.634
	95	15.92	R, s	0.406	53 I	127	100	R	0.9
	96	16.68	S	0.425	54 Xe	124	0.121	P	0.00571
	97	9.55	R, s	0.244		126	0.108	P	0.00509
	98	24.13	R, s	0.615		128	2.19	S	0.103
	100	9.63	R	0.246		129	27.34	R	1.28
44 Ru	96	5.52	P	0.103		130	4.35	S	0.205
	98	1.88	P	0.035		131	21.69	R	1.02
	99	12.7	R, s	0.236		132	26.5	R, s	1.24
	100	12.6	S	0.234		134	9.76	R	0.459
	101	17	R, s	0.316		136	7.94	R	0.373
	102	31.6	R, S	0.588	55 Cs	133	100	R, s	0.372
	104	18.7	R	0.348	56 Ba	130	0.106	P	0.00476
45 Rh	103	100	R, s	0.344		132	0.101	P	0.00453
46 Pd	102	1.02	P	0.0142		134	2.417	S	0.109
	104	11.14	S	0.155		135	6.592	R, s	0.296
	105	22.33	R, s	0.31		136	7.854	S	0.353
	106	27.33	R, S	0.38		137	11.23	S, r	0.504
	108	26.46	R, S	0.368		138	71.7	S	3.22
	110	11.72	R	0.163	57 La	138	0.089	P	0.000397
47 Ag	107	51.839	R, s	0.252		138			0.000409
	109	48.161	R, s	0.234		139	99.911	S, r	0.446
48 Cd	106	1.25	P	0.0201	58 Ce	136	0.19	P	0.00216
	108	0.89	P	0.0143		138	0.25	P	0.00284
	110	12.49	S	0.201		138			0.00283
	111	12.8	R, S	0.206		140	88.48	S, r	1.005
	112	24.13	S, R	0.388		142	11.08	R	0.126
	113	12.22	R, S	0.197	59 Pr	141	100	R, S	0.167
	114	28.73	S, R	0.463	60 Nd	142	27.13	S	0.225
	116	7.49	R	0.121		143	12.18	R, S	0.101
49 In	113	4.3	p, s, r	0.0079		143			0.1
	115	95.7	R, S	0.176		144	23.8	S, R	0.197
50 Sn	112	0.973	P	0.0372		145	8.3	R, s	0.0687
	114	0.659	P, s	0.0252		146	17.19	R, S	0.142
	115	0.339	p, r, s	0.0129		148	5.76	R	0.0477
	116	14.538	S, r	0.555		150	5.64	R	0.0467

Z	A	Atom %	Process	Abund.	Z	A	Atom %	Process	Abund.	
62 Sm	144	3.1	P	0.008	73 Ta	180	0.012	p, s, r	2.48E-6	
	147	15	R, s	0.0387		181	99.988	R, S	0.0207	
		147		0.0399	74 W	180	0.13	P	0.000173	
	148	11.3	S	0.0292		182	26.3	R, s	0.035	
	149	13.8	R, S	0.0356		183	14.3	R, s	0.019	
	150	7.4	S	0.0191		184	30.67	R, s	0.0408	
	152	26.7	R, S	0.0689		186	28.6	R	0.038	
	154	22.7	R	0.0586		75 Re	185	37.4	R, s	0.0193
	63 Eu	151	47.8	R, s	0.0465		187	62.6	R	0.0324
		153	52.2	R, s	0.0508			187		0.0351
64 Gd	152	0.2	P, s	0.00066	76 Os	184	0.018	P	0.000122	
	154	2.18	S	0.00719		186	1.58	S	0.0107	
	155	14.8	R, s	0.0488		187	1.6	S	0.0108	
	156	20.47	R, s	0.0676			187		0.00807	
	157	15.65	R, s	0.0516		188	13.3	R, s	0.0898	
	158	24.84	R, s	0.082		189	16.1	R	0.109	
	160	21.86	R	0.0721		190	26.4	R	0.178	
	65 Tb	159	100	R		0.0603	192	41	R	0.277
66 Dy		156	0.056	P		0.000221	77 Ir	191	37.3	R
	158	0.096	P	0.000378		193		62.7	R	0.414
	160	2.344	S	0.00922	78 Pt	190	0.0127	P	0.00017	
	161	18.91	R	0.0745		192	0.78	S	0.0105	
	162	25.51	R, s	0.101		194	32.9	R	0.441	
	163	24.9	R	0.0982		195	33.8	R	0.453	
	164	28.19	R, S	0.111		196	25.2	R	0.338	
	67 Ho	165	100	R		0.0889	198	7.19	R	0.0963
68 Er		162	0.14	P		0.000351	79 Au	197	100	R
	164	1.61	P, S	0.00404		80 Hg		196	0.1534	P
	166	33.6	R, s	0.0843	198		9.968	S	0.0339	
	167	22.95	R	0.0576	199		16.873	R, S	0.0574	
	168	26.8	R, S	0.0672	200		23.096	S, r	0.0785	
	170	14.9	R	0.0374	201		13.181	S, r	0.0448	
	69 Tm	169	100	R, s	0.0378		202	29.863	S, r	0.1015
		70 Yb	168	0.13	P		0.000322	204	6.865	R
170	3.05		S	0.00756	81 Tl		203	29.524	R, S	0.0543
171	14.3		R, s	0.0354		205	70.476	S, R	0.1297	
172	21.9		R, S	0.0543	82 Pb	204	1.94	S	0.0611	
173	16.12		R, s	0.04		206	19.12	R, S	0.602	
174	31.8		S, R	0.0788			206		0.593	
176	12.7		R	0.0315		207	20.62	R, S	0.65	
71 Lu	175		97.41	R, s		0.0357		207		0.644
	176	2.59	S	0.000951		208	53.31	R, s	1.837	
72 Hf				0.001035		208		1.828		
	174	0.162	P	0.000249	83 Bi	209	100	R, s	0.144	
	176	5.206	S	0.00802		90 Th	232	100	R	0.0335
				0.00793			232		0.042	
	177	18.606	R, s	0.0287	92 U	235	0.72	R	6.48E-5	
	178	24.297	R, S	0.042			235		0.00573	
	179	13.629	R, s	0.021		238	99.2745	R	0.00893	
	180	35.1	S, R	0.0541			238		0.0181	

Abbreviation for various processes: U = cosmological nucleosynthesis, H = hydrogen burning, N = hot or explosive hydrogen burning, He = helium burning, C = carbon burning, O = oxygen burning, Ne = neon burning, Ex = explosive nucleosynthesis, Eq = nuclear statistical equilibrium, S = slow (s)-process, R = rapid (r)-process, P = proton (p)-process, and X = cosmic ray spallation and others. Processes are listed in the order of importance, with minor processes (10-30% for r- and s- processes) shown in lower case.

Bold values are abundances of radionuclides 4.55 billion years ago.