TABLE A8.3. Statistical summary of the database for concentrations of seven "miscellaneous minor elements" in mare basalts (MBAS) and in soils and regolith breccias (S&RB); all values are in μg/g (see section 8.5, Fig.8.14).

	P	Sc	V	Cr	Mn	Ga	Sr
Apollo 11 MBAS							
N	7	64	62	76	79	11	10
Average	636	83.5	78.2	2090	1919	4.1	163
Std. dev.	171	8.0	18.7	473	193	0.8	28
Minimum	436	65	38.5	1220	1480	3.0	100
Maximum	873	105	136	3381	2490	5.2	209
Apollo 12 MBAS							
N	5	32	19	32	32	23	8
Average	427	48.3	170.1	3641	2082	4.1	113
Std. dev.	160	7.2	30.3	1097	107	0.9	27
Minimum	305	37	126	2025	1845	2.7	72
Maximum	742	63	221	6570	2290	5.9	145
Apollo 14 MBAS							
N	2	17	14	17	17	2	2
Average	393	56.5	111.8	2673	1795	3.7	87
Std. dev.		5.0	22.7	705	98		
Minimum	349	46	63	1574	1650	3.3	73
Maximum	436	63	139	3724	2070	4.0	100
Apollo 15 MBAS							
N	19	72	66	72	72	23	21
Average	363	40.4	198.9	4027	2077	4.2	113
Std. dev.	116	4.6	32.7	1223	128	1.0	20
Minimum	218	30	116	1917	1541	2.9	80
Maximum	567	58	266	11300	2310	7.8	150
Apollo 16 MBAS (clast in breccia 60639)							
N		1	1	1	1		
Average		73	78	2053	1952		
Apollo 17 MBAS							
N	16	114	109	114	114	20	21
Average	288	78.6	104.3	2983	1925	5.1	163
Std. dev.	92	8.7	37.0	808	166	1.8	28
Minimum	175	25	20	1273	1557	2.2	104
Maximum	524	96	256	6420	3230	8.3	209
Luna 16 MBAS							
N		3	3	3	3	1	1
Average		66.3	76.7	1506	1996	3.7	404
Std. dev.		3.8	11.1	93	31		
Minimum		61	62	1403	1952		
Maximum		69	89	1629	2022		
Luna 24 MBAS							
N		8	8	8	8	1	1
Average		46.3	167.9	1845	1938	1.8	110
Std. dev.		8.5	10.2	341	131		
Minimum		38	154	1478	1774		
Maximum		66	179	2608	2208		
Apollo 11 S&RB							
N	5	7	7	14	14	5	6
Average	560	62.4	69.6	1986	1662	5.0	163
Std. dev.	68	3.9	11.1	173	80	1.1	2
Minimum	480	55	58	1574	1487	4.0	160
Maximum	654	68	92	2300	1815	7	165

TABLE A8.3. (continued)

	P	Sc	V	Cr	Mn	Ga	Sr
Apollo 12 S&RB							
N	4	15	10	15	15	8	5
Average	1616	37.1	114.4	2468	1600	4.7	138
Std. dev.	420	3.9	17.6	397	178	0.4	32
Minimum	1265	27	85	1610	1247	4.1	90
Maximum	2334	44	143	3230	1910	5.2	190
Apollo 14 S&RB							
N	8	16	15	17	17	10	9
Average	2073	23.1	51.1	1496	1009	6.2	184
Std. dev.	482	3.5	6.7	198	75	1.4	74
Minimum	1003	17.8	41.8	1136	840	4.4	135
Maximum	2531	30	62	1848	1084	8.3	390
Apollo 15 S&RB							
N	22	52	40	54	54	21	26
Average	908	27.1	110.4	2530	1445	4.0	138
Std. dev.	228	4.9	32.6	529	228	0.7	19
Minimum	590	20	57.5	1506	1120	2.9	100
Maximum	1570	39.9	200	3810	2014	5.1	170
Apollo 16 S&RB							
N	23	53	35	51	48	35	33
Average	570	9.3	21.1	728	511	4.3	154
Std. dev.	229	1.5	5.3	121	58	0.8	22
Minimum	131	5.0	7.5	411	310	3.1	120
Maximum	1180	13.2	31.0	980	620	5.7	210
Apollo 17 S&RB							
N	30	64	50	64	63	35	43
Average	453	37.0	71.0	2220	1252	5.8	153
Std. dev.	146	18.2	27.4	667	363	3.4	21
Minimum	208	15	28	1230	798	2.6	112
Maximum	698	78	140	4030	1950	16.5	210
Luna 16 S&RB							
N	1	4	4	4	4	1	1
Average	380	45.8	37.2	1953	1600	4.7	266
Std. dev.		6.3	3.7	232	183		
Minimum		40	36	1595	1325		
Maximum		40	52.3	2160	1836		
Luna 20 S&RB							
N	1	2	2	2	2	1	1
Average	520	16.2	46.5	1259	813	3.7	138
Std. dev.							
Minimum		15.8	46	1230	806		
Maximum		16.5	47	1287	821		

TABLE A8.3. (continued)

	P	Sc	V	Cr	Mn	Ga	Sr
Luna 24 S&RB							
N	1	7	7	7	7	1	6
Average	179	40.3	149.7	2657	1962	1.2	97
Std. dev.		1.7	7.7	249	54		10
Minimum		37	139	2163	1898		81
Maximum		43	159	3053	2068		109
AMET S&RB							
N	2	3	3	3	3	3	3
Average	95	11.5	30.0	917	611	4.0	144
Std. dev.		1.8	3.9	31	35	1.4	13
Minimum	90	9.1	24.6	890	580	2.7	134
Maximum	100	13.3	33.5	960	660	5.9	162

Note that only the mare basalts (MBAS) and the soils and regolith breccias (S&RB) are included in this table. The data for highland monomict rocks (HMCT) and polymict breccias (BX) show so much scatter that statistics are practically meaningless. For the data listed, standard deviations are not given in those categories where the number of analyses (N) is <3. Abbreviations: N = number of analyses, Std. dev. = standard deviation, MBAS = mare basalts, S&RB = soils and regolith breccias, AMET = Antarctic lunar meteorites.

Main sources of data used for this table: **P:** refs. 1*, 2; **Sc:** refs. 1, 2, 3, 4, 5; **V:** refs. 1, 2, 3†, 4, 5; **Cr:** refs. 1, 2, 3, 4, 5; **Mn:** refs. 1, 2, 3, 4, 5; **Ga:** refs. 1, 2, 3, 4; **Sr:** refs. 1‡, 2, 3, 4§.

References: **1.** H.J. Rose and coworkers (a series of 9 papers published in the *Proceedings of the Lunar Science Conference*, beginning with *Rose et al.*, 1970, and ending with *Rose et al.*, 1975 and *Christian et al.*, 1976): data from XRF spectrometry (P, Cr, Mn) or one of several techniques based on "wet" chemistry followed by spectrographic analysis (P, Cr, Mn, Sc, V, Ga, Sr). **2.** H. Wänke and coworkers (a series of 9 papers published in the *Proceedings of the Lunar and Planetary Science Conference*, beginning with *Wänke et al.*, 1970a, and ending with *Palme et al.*, 1984, and *Ostertag et al.*, 1987): data from XRF (P, Cr, Mn) or INAA (Cr, Mn, Sc, V, Ga, Sr). **3.** *Brunfelt et al.* (1971, 1972a,b, 1973a,b, 1974a,b); data from INAA. **4.** P.H. Warren and coworkers (a series pf 14 papers published in the *Proceedings of the Lunar Science Conference*, beginning with *Boynton et al.*, 1976b, and ending with *Jerde et al.*, 1987, and *Warren et al.*, 1987): data from INAA. **5.** R.A. Schmitt and coworkers (a series of 23 papers published in the *Proceedings* or in the abstracts of the Lunar and Planetary Science Conference, beginning with *Wakita et al.*, 1970, and ending with *Delano et al.*, 1986): data form INAA. In addition to these references, data for a broad range of miscellaneous minor elements were obtained from *Laul et al.* (1972a,b), *Laul and Schmitt* (1973a), and *Ma et al.* (1978). Some of the data plotted but not tabulated for highland monomict rocks are from *Ryder and Norman* (1979); additional P data for Apollo 11 MBAS are from *Compston et al.* (1970). For samples from the U.S.S.R. Luna missions, sources used in addition to those enumerated above are *Albee et al.* (1972), *Bakos et al.* (1977), *Bansal et al.* (1972), *Barsukov et al.* (1980), *Blanchard et al.* (1978), *Bobrov et al.* (1980), *Cimbalhikova et al.* (1977), *Gangadharan et al.* (1974), *Gillum et al.* (1972), *Helmke and Haskin* (1972a,b), *Helmke et al.* (1973), *Hubbard et al.* (1972b, 1977), *Jerome and Philippot* (1973), *Jerome et al.* (1972), *Jovanovic et al.* (1978), *Kolesov and Surkov* (1980), *Kuznetsov et al.* (1979), *Laul et al.* (1978b, 1981), *Murali et al.* (1979), *Nava and Philpotts* (1973), *Nyquist et al.* (1978), *Philpotts et al.* (1972), *Surkov and Kolesov* (1979), and *Vinogradov* (1971, 1973). Essentially all these data were obtained using INAA. For the Antarctic lunar meteorites, *Koeberl et al.* (1989) and *Warren et al.* (1989) list all the published sources used, which are generally based on INAA.

* The P data reported by Rose and coworkers appear unreliable at concentrations below roughly 0.04 wt.%.

† The V data reported by Brunfelt and coworkers for Apollo 16 samples appear unreliable (too high).

‡ The Sr data reported by Rose and coworkers for Apollo 12 samples appear unreliable (too low).

§ Schmitt and coworkers also report Sr data in some of their most recent papers.