

TABLE A8.1. Statistical data for concentrations of major elements (values in weight percent) (see section 8.3, Fig.8.2).

| | SiO ₂ | TiO ₂ | Al ₂ O ₃ | FeO | MgO | CaO | Na ₂ O |
|-----------------------|------------------|------------------|--------------------------------|-------|-------|-------|-------------------|
| Apollo 11 MBAS | | | | | | | |
| N | 11 | 11 | 11 | 11 | 11 | 11 | 11 |
| Average | 40.46 | 10.41 | 10.08 | 19.22 | 7.01 | 11.54 | 0.38 |
| Std. dev. | 1.37 | 1.02 | 0.84 | 1.28 | 0.87 | 0.82 | 0.04 |
| Minimum | 38.59 | 8.47 | 7.91 | 16.51 | 5.91 | 10.30 | 0.34 |
| Maximum | 42.89 | 11.87 | 10.87 | 21.71 | 8.52 | 12.65 | 0.44 |
| Apollo 12 MBAS | | | | | | | |
| N | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Average | 44.88 | 3.62 | 8.93 | 20.48 | 10.64 | 9.81 | 0.25 |
| Std. dev. | 1.76 | 0.87 | 1.78 | 1.38 | 3.99 | 1.66 | 0.05 |
| Minimum | 41.56 | 2.59 | 5.30 | 16.78 | 5.75 | 6.31 | 0.16 |
| Maximum | 47.27 | 5.20 | 12.63 | 22.64 | 19.97 | 12.25 | 0.33 |
| Apollo 15 MBAS | | | | | | | |
| N | 9 | 14 | 14 | 14 | 15 | 14 | 15 |
| Average | 46.68 | 1.97 | 10.21 | 19.87 | 8.76 | 10.63 | 0.30 |
| Std. dev. | 1.53 | 0.39 | 1.64 | 2.05 | 1.17 | 0.49 | 0.06 |
| Minimum | 45.02 | 1.28 | 8.77 | 15.30 | 6.45 | 9.89 | 0.21 |
| Maximum | 48.10 | 2.51 | 13.70 | 22.52 | 10.60 | 11.50 | 0.39 |
| Apollo 17 MBAS | | | | | | | |
| N | 19 | 26 | 25 | 25 | 25 | 26 | 26 |
| Average | 39.03 | 11.94 | 9.00 | 18.82 | 8.54 | 10.82 | 0.39 |
| Std. dev. | 1.03 | 1.11 | 0.78 | 0.73 | 1.13 | 0.59 | 0.03 |
| Minimum | 37.93 | 8.30 | 8.38 | 16.60 | 6.15 | 9.79 | 0.35 |
| Maximum | 41.92 | 13.08 | 12.10 | 19.90 | 10.36 | 12.15 | 0.48 |
| Luna 16 MBAS | | | | | | | |
| N | 3 | 6 | 6 | 9 | 6 | 9 | 9 |
| Average | 44.0 | 4.77 | 13.83 | 18.7 | 6.40 | 11.82 | 0.53 |
| Std. dev. | 1.4 | 0.49 | 0.81 | 0.7 | 0.51 | 0.81 | 0.13 |
| Minimum | 42.8 | 4.0 | 13.3 | 17.8 | 5.95 | 10.4 | 0.28 |
| Maximum | 45.5 | 5.3 | 15.4 | 19.9 | 7.05 | 13.0 | 0.70 |
| Luna 24 MBAS | | | | | | | |
| N | 2 | 6 | 6 | 7 | 6 | 6 | 7 |
| Average | 46.00 | 1.02 | 12.20 | 21.58 | 7.40 | 12.20 | 0.23 |
| Std. dev. | | 0.19 | 1.30 | 0.87 | 1.60 | 0.90 | 0.06 |
| Minimum | 45.20 | 0.75 | 10.10 | 20.46 | 6.00 | 10.80 | 0.10 |
| Maximum | 46.80 | 1.30 | 13.80 | 22.40 | 10.50 | 13.50 | 0.29 |
| Anorthosite | | | | | | | |
| N | 3 | 7 | 12 | 21 | 13 | 21 | 21 |
| Average | 45.57 | 0.08 | 33.4 | 1.00 | 1.21 | 19.1 | 0.40 |
| Std. dev. | 0.66 | 0.07 | 1.6 | 1.1 | 1.20 | 1.1 | 0.06 |
| Minimum | 45 | 0.01 | 31 | 0.16 | 0.05 | 16.9 | 0.26 |
| Maximum | 46 | 0.23 | 36 | 4.0 | 3.7 | 21 | 0.54 |
| Norite | | | | | | | |
| N | 11 | 17 | 23 | 23 | 23 | 24 | 24 |
| Average | 50.6 | 0.30 | 17.0 | 8.2 | 12.5 | 9.9 | 0.38 |
| Std. dev. | 1.6 | 0.02 | 3.1 | 2.5 | 2.1 | 1.5 | 0.05 |
| Minimum | 47.7 | 0.27 | 15 | 3.9 | 10.2 | 8.8 | 0.32 |
| Maximum | 52 | 0.33 | 23 | 10.7 | 15.9 | 12.8 | 0.44 |
| Troctolite | | | | | | | |
| N | 2 | 8 | 11 | 12 | 11 | 12 | 12 |
| Average | 43.5 | 0.18 | 24.0 | 4.1 | 15.1 | 13.4 | 0.37 |
| Std. dev. | | 0.22 | 4.3 | 1.7 | 6.4 | 2.0 | 0.09 |
| Minimum | 42.9 | 0.04 | 15.02 | 2.26 | 8.3 | 9.2 | 0.20 |
| Maximum | 44.1 | 0.69 | 28.7 | 8.55 | 30.5 | 16 | 0.47 |

TABLE A8.1 (continued).

| | SiO ₂ | TiO ₂ | Al ₂ O ₃ | FeO | MgO | CaO | Na ₂ O |
|---------------------------|------------------|------------------|--------------------------------|-------|-------|-------|-------------------|
| Apollo 11 S&RB | | | | | | | |
| N | 8 | 13 | 13 | 13 | 13 | 13 | 13 |
| Average | 41.99 | 7.94 | 12.58 | 16.40 | 7.93 | 11.74 | 0.47 |
| Std. dev. | 0.31 | 0.62 | 0.80 | 0.79 | 0.17 | 0.25 | 0.03 |
| Minimum | 41.50 | 7.17 | 11.47 | 15.41 | 7.67 | 11.34 | 0.40 |
| Maximum | 42.43 | 9.17 | 13.77 | 17.74 | 8.33 | 12.12 | 0.53 |
| Apollo 12 S&RB | | | | | | | |
| N | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Average | 46.21 | 2.61 | 12.13 | 17.19 | 10.42 | 9.85 | 0.41 |
| Std. dev. | 0.12 | 0.10 | 0.86 | 1.07 | 1.07 | 1.14 | 0.03 |
| Minimum | 46.07 | 2.50 | 11.14 | 16.33 | 9.73 | 8.54 | 0.37 |
| Maximum | 46.29 | 2.67 | 12.69 | 18.39 | 11.65 | 10.64 | 0.43 |
| Apollo 15 S&RB | | | | | | | |
| N | 12 | 14 | 14 | 14 | 14 | 14 | 14 |
| Average | 47.19 | 1.46 | 14.32 | 14.98 | 10.95 | 10.47 | 0.40 |
| Std. dev. | 0.74 | 0.34 | 2.62 | 3.30 | 0.53 | 0.96 | 0.07 |
| Minimum | 46.50 | 1.00 | 9.86 | 11.55 | 9.80 | 8.96 | 0.30 |
| Maximum | 48.43 | 2.17 | 17.91 | 20.70 | 11.67 | 11.76 | 0.50 |
| Apollo 16 S&RB | | | | | | | |
| N | 8 | 18 | 19 | 19 | 19 | 19 | 19 |
| Average | 44.89 | 0.53 | 27.23 | 4.98 | 6.00 | 14.56 | 0.47 |
| Std. dev. | 0.51 | 0.14 | 1.84 | 1.08 | 1.76 | 3.64 | 0.08 |
| Minimum | 44.10 | 0.26 | 23.04 | 2.91 | 3.97 | 4.54 | 0.30 |
| Maximum | 48.80 | 0.78 | 30.22 | 7.73 | 10.32 | 17.00 | 0.72 |
| Apollo 17 S&RB | | | | | | | |
| N | 15 | 16 | 16 | 16 | 16 | 16 | 16 |
| Average | 44.47 | 2.84 | 18.93 | 10.29 | 9.95 | 12.29 | 0.43 |
| Std. dev. | 1.41 | 2.01 | 2.89 | 2.67 | 0.30 | 0.61 | 0.03 |
| Minimum | 41.57 | 1.22 | 12.43 | 7.95 | 9.32 | 11.06 | 0.37 |
| Maximum | 46.07 | 7.35 | 21.38 | 15.94 | 10.55 | 13.16 | 0.48 |
| Luna 16 S&RB | | | | | | | |
| N | 3 | 3 | 3 | 3 | 1 | 3 | 3 |
| Average | 44.37 | 3.30 | 15.68 | 16.75 | 8.78 | 11.50 | 0.35 |
| Std. dev. | 2.93 | 0.10 | 0.34 | 0.09 | | 0.86 | 0.02 |
| Minimum | 41.70 | 3.20 | 15.33 | 16.64 | | 11.00 | 0.34 |
| Maximum | 47.50 | 3.39 | 16.00 | 16.80 | | 12.49 | 0.37 |
| Luna 20 S&RB | | | | | | | |
| N | 3 | 5 | 5 | 5 | 4 | 5 | 5 |
| Average | 45.2 | 0.50 | 22.75 | 7.46 | 9.69 | 14.70 | 0.39 |
| Std. dev. | 0.72 | 0.06 | 0.69 | 0.47 | 0.35 | 0.93 | 0.11 |
| Minimum | 44.4 | 0.43 | 21.6 | 7.02 | 9.19 | 13.38 | 0.29 |
| Maximum | 45.8 | 0.56 | 23.44 | 8.1 | 10 | 15.8 | 0.55 |
| Luna 24 S&RB | | | | | | | |
| N | 1 | 5 | 6 | 6 | 6 | 6 | 6 |
| Average | 45.40 | 1.04 | 11.95 | 19.55 | 9.87 | 11.07 | 0.28 |
| Std. dev. | 0.15 | 0.43 | 0.62 | 0.43 | 0.25 | 0.01 | |
| Minimum | 0.80 | 11.10 | 18.70 | 9.00 | 10.80 | 0.27 | |
| Maximum | 1.20 | 12.30 | 20.50 | 10.20 | 11.40 | 0.30 | |
| AMET S&RB | | | | | | | |
| N | 1 | 7 | 7 | 8 | 6 | 8 | 8 |
| Average | 46.50 | 0.28 | 25.69 | 5.72 | 7.67 | 15.13 | 0.32 |
| Std. dev. | 0.05 | 0.68 | 0.38 | 0.98 | 0.38 | 0.01 | |
| Minimum | 0.23 | 25.10 | 5.40 | 6.00 | 14.80 | 0.30 | |
| Maximum | 0.37 | 26.60 | 6.50 | 8.80 | 16.00 | 0.33 | |

TABLE A8.1. (continued).

| | SiO ₂ | TiO ₂ | Al ₂ O ₃ | FeO | MgO | CaO | Na ₂ O |
|---------------------|------------------|------------------|--------------------------------|-------|-------|-------|-------------------|
| Apollo 14 BX | | | | | | | |
| N | 1 | 10 | 15 | 16 | 10 | 15 | 16 |
| Average | 48.09 | 1.51 | 16.72 | 9.53 | 10.18 | 10.67 | 0.73 |
| Std. dev. | | 0.23 | 6.04 | 2.69 | 2.88 | 2.64 | 0.13 |
| Minimum | | 1.03 | 10.50 | 0.43 | 2.08 | 9.00 | 0.48 |
| Maximum | | 1.80 | 35.20 | 11.50 | 11.70 | 19.10 | 0.98 |
| Apollo 15 BX | | | | | | | |
| N | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| Average | 1.68 | 13.96 | 14.04 | 10.25 | 12.78 | 0.46 | |
| Std. dev. | 0.32 | 2.26 | 2.77 | 0.95 | 3.39 | 0.11 | |
| Minimum | 1.16 | 9.90 | 11.10 | 9.20 | 10.30 | 0.25 | |
| Maximum | 2.05 | 16.20 | 19.20 | 11.60 | 19.20 | 0.60 | |
| Apollo 16 BX | | | | | | | |
| N | 13 | 26 | 32 | 41 | 32 | 41 | 41 |
| Average | 45.418 | 0.64 | 25.11 | 5.08 | 7.24 | 15.14 | 0.45 |
| Std. dev. | 1.35 | 0.45 | 5.01 | 2.84 | 3.24 | 2.72 | 0.08 |
| Minimum | 43.60 | 0.20 | 13.90 | 1.29 | 1.94 | 8.50 | 0.31 |
| Maximum | 49.20 | 2.15 | 33.80 | 13.35 | 13.00 | 18.90 | 0.68 |
| Apollo 17 BX | | | | | | | |
| N | 7 | 10 | 10 | 10 | 10 | 10 | 10 |
| Average | 45.21 | 2.23 | 17.82 | 9.80 | 11.55 | 11.42 | 0.53 |
| Std. dev. | 2.14 | 2.47 | 2.99 | 3.22 | 2.20 | 0.84 | 0.10 |
| Minimum | 41.79 | 0.65 | 12.26 | 7.30 | 8.80 | 9.72 | 0.41 |
| Maximum | 46.80 | 7.98 | 20.82 | 16.50 | 16.72 | 12.56 | 0.69 |
| Luna 20 BX | | | | | | | |
| N | 19 | 19 | 27 | 19 | 23 | 23 | 24 |
| Average | 0.49 | 23.18 | 7.11 | 10.46 | 13.75 | 0.42 | |
| Std. dev. | 0.22 | 2.78 | 2.05 | 3.24 | 2.25 | 0.20 | |
| Minimum | 0.20 | 19.50 | 3.80 | 3.10 | 6.70 | 0.25 | |
| Maximum | 0.90 | 30.00 | 13.30 | 16.20 | 19.20 | 1.32 | |

Note that standard deviations are not given for those categories where the number of analyses (N) is <3. N = number of analyses, Std. Dev. = standard deviation, MBAS = mare basalts, S&RB = soils and regolith breccias, BX = polymict breccias, AMET = Antarctic lunar meteorites. Highland monomict rocks (HMCT in Fig. 8.2) are listed by individual rock type name (anorthosite, norite, and troctolite; see section 6.3).

References: Blanchard et al. (1974, 1975a, 1978); Compston et al. (1972a); Dymek et al. (1975a,b); Gillum et al. (1972); Haskin et al. (1973, 1974, 1981); Helmke et al. (1973); Hubbard et al. (1973); James et al. (1984); Jerome and Phillipot (1973); Kallemyen and Warren (1983); Korotev et al. (1981); Korotev et al. (1983); Laul and Schmitt (1973a,b); Laul et al. (1977, 1983); M. Lindstrom (1984); M. Lindstrom et al. (1984, 1986); Lunatic Asylum (1970); Ma et al. (1977); D. S. McKay et al. (1986); Nava and Phillipot (1973); Ostertag et al. (1986); Palme et al. (1978, 1983); Rhodes and Blanchard (1980, 1981); Rhodes and Hubbard (1973); Rhodes et al. (1974, 1976, 1977); Ryder and Norman (1978, 1979); Shervais et al. (1985a,b); Vinogradov (1971, 1973); Wänke et al. (1970a, 1971, 1972, 1973, 1974, 1975, 1976, 1977); Warren and Kallemyen (1986); Warren and Wasson (1979b, 1980); Winzer et al. (1974).