

AM-93-546

Crystal chemistry of ferromagnesian silicate spinels: Evidence for Mg-Si disorder

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For deposit: Table 2

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Table 2A

| Sample number mgsisp1 | | | | Mg2SiO4 | |
|-----------------------|---|----|--------|---------|--------|
| h | k | l | Fo | Fc | Sg |
| 1 | 1 | 1 | 19.0 | 12.7 | -18.68 |
| 0 | 2 | 2 | 483.4 | 489.0 | 4.22 |
| 2 | 2 | 2 | 290.8 | 203.8 | -3.22 |
| 1 | 1 | 3 | 746.0 | 746.0 | 6.20 |
| 1 | 3 | 3 | 148.1 | 152.8 | 2.72 |
| 3 | 3 | 3 | 708.7 | 694.1 | 6.12 |
| 0 | 0 | 4 | 1268.0 | 1226.6 | 10.32 |
| 2 | 2 | 4 | 380.9 | 375.2 | 3.90 |
| 0 | 4 | 4 | 1588.2 | 1570.8 | 12.96 |
| 2 | 4 | 4 | 28.1 | 15.0 | 17.56 |
| 4 | 4 | 4 | 653.4 | 662.8 | 5.92 |
| 1 | 1 | 5 | 491.0 | 491.6 | 4.62 |
| 1 | 3 | 5 | 9.9 | 19.2 | -49.50 |
| 3 | 3 | 5 | 495.3 | 499.2 | 4.80 |
| 1 | 5 | 5 | 63.5 | 66.2 | 4.04 |
| 3 | 5 | 5 | 363.0 | 364.3 | 4.18 |
| 5 | 5 | 5 | 251.4 | 257.4 | 3.96 |
| 0 | 2 | 6 | 318.2 | 319.7 | 3.80 |
| 2 | 2 | 6 | 33.9 | 22.3 | 9.22 |
| 2 | 4 | 6 | 288.5 | 290.8 | 3.86 |
| 4 | 4 | 6 | 26.9 | 9.8 | -22.08 |
| 0 | 6 | 6 | 266.1 | 264.9 | 4.04 |
| 2 | 6 | 6 | 42.7 | 27.1 | 13.34 |
| 4 | 6 | 6 | 206.4 | 212.9 | 4.24 |
| 6 | 6 | 6 | 27.3 | 6.2 | -31.18 |
| 1 | 1 | 7 | 72.8 | 73.8 | 4.12 |
| 1 | 3 | 7 | 483.3 | 485.0 | 4.94 |
| 3 | 3 | 7 | 99.5 | 103.7 | 4.28 |
| 1 | 5 | 7 | 367.8 | 368.9 | 4.46 |
| 3 | 5 | 7 | 39.6 | 37.7 | 7.86 |
| 5 | 5 | 7 | 12.0 | 11.7 | -60.12 |
| 1 | 7 | 7 | 66.8 | 68.4 | 4.94 |
| 3 | 7 | 7 | 360.7 | 357.3 | 4.84 |
| 5 | 7 | 7 | 289.2 | 283.9 | 4.86 |
| 0 | 0 | 8 | 1079.0 | 1067.4 | 9.20 |
| 2 | 2 | 8 | 251.3 | 253.8 | 4.18 |
| 0 | 4 | 8 | 438.0 | 441.4 | 4.84 |
| 2 | 4 | 8 | 11.5 | 17.1 | -57.74 |
| 4 | 4 | 8 | 801.8 | 800.3 | 7.34 |
| 2 | 6 | 8 | 194.6 | 196.1 | 4.44 |
| 4 | 6 | 8 | 12.5 | 13.6 | -62.50 |
| 0 | 8 | 8 | 639.7 | 632.7 | 6.50 |
| 1 | 1 | 9 | 61.7 | 61.7 | 4.90 |
| 1 | 3 | 9 | 271.4 | 273.6 | 4.28 |
| 3 | 3 | 9 | 12.0 | 14.8 | -59.88 |
| 1 | 5 | 9 | 196.9 | 195.3 | 4.46 |
| 3 | 5 | 9 | 53.1 | 56.0 | 6.20 |
| 0 | 2 | 10 | 200.1 | 204.8 | 4.34 |
| 2 | 2 | 10 | 26.9 | 6.3 | -26.80 |
| 2 | 4 | 10 | 174.9 | 173.1 | 4.72 |
| 1 | 1 | 11 | 286.0 | 286.6 | 4.74 |

Items with Sg<0 are Rejected

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MS 6595

Table 2B.

Sample number 1013sp3 (Mg.4,Fe.6)2SiO4

| h | k | l | Fo | Fc | Sg |
|---|---|----|--------|--------|--------|
| 1 | 1 | 1 | 380.6 | 380.8 | 2.70 |
| 0 | 2 | 2 | 503.7 | 500.9 | 3.52 |
| 2 | 2 | 2 | 405.8 | 465.4 | -3.16 |
| 1 | 1 | 3 | 1098.9 | 1095.2 | 6.94 |
| 1 | 3 | 3 | 480.5 | 475.0 | 3.64 |
| 3 | 3 | 3 | 1023.6 | 1013.3 | 6.66 |
| 0 | 0 | 4 | 1842.6 | 1843.6 | 11.42 |
| 2 | 2 | 4 | 381.2 | 377.3 | 3.32 |
| 0 | 4 | 4 | 2054.4 | 2079.3 | 12.76 |
| 2 | 4 | 4 | 46.3 | 22.4 | 7.64 |
| 4 | 4 | 4 | 1068.9 | 1076.1 | 7.08 |
| 1 | 1 | 5 | 734.1 | 734.8 | 5.06 |
| 1 | 3 | 5 | 239.3 | 245.4 | 3.20 |
| 3 | 3 | 5 | 727.5 | 731.7 | 5.20 |
| 1 | 5 | 5 | 115.9 | 111.1 | 4.14 |
| 3 | 5 | 5 | 564.2 | 554.6 | 4.58 |
| 5 | 5 | 5 | 421.3 | 421.0 | 4.24 |
| 0 | 2 | 6 | 312.8 | 317.8 | 3.46 |
| 2 | 2 | 6 | 483.7 | 481.8 | 4.06 |
| 2 | 4 | 6 | 310.7 | 311.4 | 3.70 |
| 4 | 4 | 6 | 9.8 | 13.9 | -48.80 |
| 0 | 6 | 6 | 300.8 | 300.9 | 3.92 |
| 2 | 6 | 6 | 398.3 | 399.4 | 4.20 |
| 4 | 6 | 6 | 209.6 | 207.5 | 4.26 |
| 6 | 6 | 6 | 332.5 | 329.8 | 4.50 |
| 1 | 1 | 7 | 292.0 | 292.4 | 3.60 |
| 1 | 3 | 7 | 715.1 | 716.7 | 5.30 |
| 3 | 3 | 7 | 313.8 | 318.9 | 3.88 |
| 1 | 5 | 7 | 558.5 | 557.8 | 4.74 |
| 3 | 5 | 7 | 206.3 | 205.5 | 4.16 |
| 5 | 5 | 7 | 126.9 | 132.4 | 5.14 |
| 1 | 7 | 7 | 242.3 | 239.5 | 4.34 |
| 3 | 7 | 7 | 550.3 | 553.0 | 5.04 |
| 5 | 7 | 7 | 451.8 | 445.7 | 4.90 |
| 0 | 0 | 8 | 1430.5 | 1450.7 | 9.24 |
| 2 | 2 | 8 | 264.5 | 269.2 | 3.92 |
| 0 | 4 | 8 | 762.7 | 761.1 | 5.72 |
| 2 | 4 | 8 | 10.0 | 24.6 | -50.10 |
| 4 | 4 | 8 | 1126.0 | 1118.8 | 7.72 |
| 2 | 6 | 8 | 205.0 | 205.4 | 4.52 |
| 4 | 6 | 8 | 11.2 | 19.0 | -54.62 |
| 0 | 8 | 8 | 918.0 | 909.9 | 6.84 |
| 2 | 8 | 8 | 36.8 | 35.9 | 24.72 |
| 1 | 1 | 9 | 83.1 | 81.3 | 6.04 |
| 1 | 3 | 9 | 433.0 | 433.1 | 4.48 |
| 3 | 3 | 9 | 123.2 | 122.9 | 5.10 |
| 1 | 5 | 9 | 340.1 | 340.0 | 4.44 |
| 3 | 5 | 9 | 69.1 | 69.2 | 8.42 |
| 5 | 5 | 9 | 11.3 | 23.9 | -56.60 |
| 1 | 7 | 9 | 104.8 | 106.2 | 6.42 |
| 0 | 2 | 10 | 222.5 | 229.2 | 4.50 |
| 2 | 2 | 10 | 324.3 | 330.7 | 4.48 |
| 2 | 4 | 10 | 178.7 | 179.7 | 4.92 |
| 4 | 4 | 10 | 35.2 | 8.1 | 17.54 |
| 1 | 1 | 11 | 453.9 | 454.0 | 4.90 |
| 1 | 3 | 11 | 199.2 | 199.5 | 5.00 |

Items with Sg<0 are Rejected

Table 2C

Sample number 1097sp1 (Mg.2Fe.8)2SiO4

| h | k | l | Fo | Fc | Sg |
|---|---|----|--------|--------|--------|
| 1 | 1 | 1 | 483.3 | 484.5 | 4.58 |
| 0 | 2 | 2 | 502.3 | 501.5 | 4.88 |
| 2 | 2 | 2 | 601.1 | 650.1 | -5.78 |
| 1 | 1 | 3 | 1189.0 | 1191.4 | 10.88 |
| 1 | 3 | 3 | 572.2 | 563.9 | 5.64 |
| 3 | 3 | 3 | 1118.7 | 1096.3 | 10.38 |
| 0 | 0 | 4 | 2011.2 | 2017.9 | 18.22 |
| 2 | 2 | 4 | 384.0 | 377.5 | 4.32 |
| 0 | 4 | 4 | 2178.8 | 2221.2 | 19.78 |
| 2 | 4 | 4 | 40.7 | 24.8 | 7.58 |
| 4 | 4 | 4 | 1209.1 | 1197.1 | 11.30 |
| 1 | 1 | 5 | 807.2 | 802.7 | 7.68 |
| 1 | 3 | 5 | 303.8 | 312.0 | 4.10 |
| 3 | 3 | 5 | 792.2 | 797.0 | 7.74 |
| 1 | 5 | 5 | 164.4 | 162.5 | 4.08 |
| 3 | 5 | 5 | 618.2 | 607.0 | 6.52 |
| 5 | 5 | 5 | 462.0 | 462.8 | 5.64 |
| 0 | 2 | 6 | 309.1 | 317.9 | 4.18 |
| 2 | 2 | 6 | 615.2 | 609.0 | 6.30 |
| 2 | 4 | 6 | 311.2 | 311.6 | 4.52 |
| 4 | 4 | 6 | 13.0 | 15.6 | -65.16 |
| 0 | 6 | 6 | 299.5 | 300.9 | 4.76 |
| 2 | 6 | 6 | 503.6 | 502.8 | 5.86 |
| 4 | 6 | 6 | 212.2 | 207.6 | 4.76 |
| 6 | 6 | 6 | 422.2 | 420.1 | 5.88 |
| 1 | 1 | 7 | 350.6 | 355.6 | 4.58 |
| 1 | 3 | 7 | 777.4 | 777.9 | 7.74 |
| 3 | 3 | 7 | 374.0 | 377.7 | 4.98 |
| 1 | 5 | 7 | 605.5 | 610.1 | 6.58 |
| 3 | 5 | 7 | 258.0 | 257.1 | 4.74 |
| 5 | 5 | 7 | 180.2 | 177.4 | 5.10 |
| 1 | 7 | 7 | 290.3 | 289.2 | 5.02 |
| 3 | 7 | 7 | 606.3 | 601.3 | 6.86 |
| 5 | 7 | 7 | 499.4 | 490.5 | 6.40 |
| 0 | 0 | 8 | 1539.8 | 1557.9 | 14.26 |
| 2 | 2 | 8 | 265.2 | 269.3 | 4.68 |
| 0 | 4 | 8 | 856.9 | 857.9 | 8.54 |
| 2 | 4 | 8 | 32.3 | 27.5 | 21.30 |
| 4 | 4 | 8 | 1218.2 | 1207.9 | 11.64 |
| 2 | 6 | 8 | 207.8 | 205.4 | 4.98 |
| 4 | 6 | 8 | 14.4 | 21.4 | -72.04 |
| 0 | 8 | 8 | 992.5 | 988.0 | 9.96 |
| 2 | 8 | 8 | 39.7 | 40.1 | 23.84 |
| 1 | 1 | 9 | 125.0 | 124.6 | 4.80 |
| 1 | 3 | 9 | 471.9 | 477.6 | 5.82 |
| 3 | 3 | 9 | 165.0 | 168.0 | 4.96 |
| 1 | 5 | 9 | 378.4 | 377.2 | 5.50 |
| 3 | 5 | 9 | 113.8 | 107.7 | 5.76 |
| 5 | 5 | 9 | 41.3 | 53.4 | 20.62 |
| 1 | 7 | 9 | 147.1 | 146.7 | 5.72 |
| 0 | 2 | 10 | 224.7 | 229.3 | 5.08 |
| 2 | 2 | 10 | 412.2 | 420.9 | 5.60 |
| 2 | 4 | 10 | 181.0 | 179.8 | 5.28 |
| 4 | 4 | 10 | 14.6 | 9.3 | -72.94 |
| 1 | 1 | 11 | 492.5 | 498.7 | 6.28 |
| 1 | 3 | 11 | 242.3 | 243.6 | 5.48 |

Items with Sg<0 are Rejected

Sample number 1102sp3 (Mg.2Fe.8)2SiO4

| h | k | l | Fo | Fc | Sg |
|---|---|----|--------|--------|---------|
| 1 | 1 | 1 | 482.4 | 483.1 | 3.04 |
| 0 | 2 | 2 | 504.8 | 503.6 | 4.10 |
| 2 | 2 | 2 | 578.5 | 637.8 | -4.02 |
| 1 | 1 | 3 | 1191.1 | 1185.1 | 5.18 |
| 1 | 3 | 3 | 556.5 | 554.2 | 4.42 |
| 3 | 3 | 3 | 1077.8 | 1083.6 | 5.40 |
| 0 | 0 | 4 | 2014.5 | 2007.1 | 7.94 |
| 2 | 2 | 4 | 374.3 | 375.2 | 4.78 |
| 0 | 4 | 4 | 2224.8 | 2206.1 | 8.86 |
| 2 | 4 | 4 | 40.8 | 28.6 | -74.14 |
| 4 | 4 | 4 | 1175.9 | 1183.0 | 6.34 |
| 1 | 1 | 5 | 796.7 | 798.8 | 5.06 |
| 1 | 3 | 5 | 295.7 | 306.5 | 5.80 |
| 3 | 3 | 5 | 774.9 | 785.2 | 5.56 |
| 1 | 5 | 5 | 174.9 | 160.1 | 8.24 |
| 3 | 5 | 5 | 604.5 | 600.8 | 5.84 |
| 5 | 5 | 5 | 448.8 | 457.5 | 6.42 |
| 0 | 2 | 6 | 307.0 | 313.2 | 6.00 |
| 2 | 2 | 6 | 595.7 | 590.6 | 5.54 |
| 2 | 4 | 6 | 309.2 | 312.3 | 6.78 |
| 4 | 4 | 6 | 22.7 | 17.3 | -118.16 |
| 0 | 6 | 6 | 307.2 | 305.5 | 7.16 |
| 2 | 6 | 6 | 481.2 | 480.5 | 6.48 |
| 4 | 6 | 6 | 205.5 | 200.6 | 8.92 |
| 6 | 6 | 6 | 404.3 | 395.0 | 7.40 |
| 1 | 1 | 7 | 339.3 | 346.7 | 6.08 |
| 1 | 3 | 7 | 753.3 | 763.6 | 5.96 |
| 3 | 3 | 7 | 358.6 | 364.9 | 6.94 |
| 1 | 5 | 7 | 597.5 | 599.4 | 6.46 |
| 3 | 5 | 7 | 241.9 | 244.9 | 8.16 |
| 5 | 5 | 7 | 163.2 | 171.9 | 10.06 |
| 1 | 7 | 7 | 280.3 | 274.7 | 8.52 |
| 3 | 7 | 7 | 588.0 | 583.9 | 7.18 |
| 5 | 7 | 7 | 480.7 | 471.8 | 7.64 |
| 0 | 0 | 8 | 1530.3 | 1538.4 | 7.86 |
| 2 | 2 | 8 | 253.4 | 267.8 | 7.84 |
| 0 | 4 | 8 | 840.4 | 841.5 | 6.54 |
| 2 | 4 | 8 | 19.7 | 31.4 | -99.82 |
| 4 | 4 | 8 | 1191.7 | 1187.1 | 7.54 |
| 2 | 6 | 8 | 208.6 | 202.3 | 9.72 |
| 4 | 6 | 8 | 22.1 | 23.6 | -110.32 |
| 0 | 8 | 8 | 978.1 | 966.1 | 8.06 |
| 2 | 8 | 8 | 44.4 | 45.4 | -64.54 |
| 1 | 1 | 9 | 116.7 | 119.2 | 10.58 |
| 1 | 3 | 9 | 463.0 | 467.0 | 6.86 |
| 3 | 3 | 9 | 163.2 | 156.6 | 10.36 |
| 1 | 5 | 9 | 368.8 | 370.2 | 8.04 |
| 3 | 5 | 9 | 93.8 | 103.1 | 14.14 |
| 5 | 5 | 9 | 22.5 | 49.8 | -112.60 |
| 1 | 7 | 9 | 141.0 | 137.5 | 12.44 |
| 0 | 2 | 10 | 233.3 | 229.7 | 9.08 |
| 2 | 2 | 10 | 392.1 | 397.2 | 7.58 |
| 2 | 4 | 10 | 172.2 | 175.4 | 10.68 |
| 4 | 4 | 10 | 22.9 | 9.5 | -114.68 |
| 1 | 1 | 11 | 483.6 | 484.9 | 7.50 |
| 1 | 3 | 11 | 236.4 | 230.3 | 10.00 |

Items with Sg<0 are Rejected