

### List of Publications (Invited in Bold Print)

- 1) Geiger, C.A., Guidotti, C.V. and Petro, W.L., 1982, Some aspects of the petrologic and tectonic history of the Precambrian rocks of Waterloo, Wisconsin. *Geoscience Wisconsin*. 6, 21-40.
- 2) Geiger, C.A., Henry, D.L., Bailey, S.W. and Maj, J.J., 1983, Crystal structure of cronstedite-2H<sub>2</sub>. *Clays and Clay Minerals*. 31, No. 2, 97-108.
- 3) Anderson, A.T. Jr., Swihart, G.H., Artioli, G. and Geiger, C.A., 1984, Segregation vesicles, gas-filter-pressing, and differentiation. *Journal of Geology*. 92, 55-72.
- 4) Geiger, C. A., 1986, A note regarding the mineralogy and sedimentology of rocks overlying the Baraboo Quartzite. In the Proterozoic Interval in Wisconsin, Greenberg, J.K., ed., *Geoscience Wisconsin* 10, 28-37.
- 5) Geiger, C.A., Newton, R.C. and Kleppa, O.J., 1987, Enthalpy of mixing of synthetic almandine-grossular and almandine-pyrope garnets from high temperature solution calorimetry. *Geochimica et Cosmochimica Acta*. 51, 1755-1763.
- 6) Geiger, C.A., Kleppa, O.J. Mysen, B., Lattimer, J.M., and Grossman, L., 1988, Enthalpies of formation of CaAl<sub>4</sub>O<sub>7</sub> and CaAl<sub>12</sub>O<sub>19</sub> (hibonite) by high temperature alkali borate solution calorimetry. *Geochimica et Cosmochimica Acta*. 52, 1729-1736.
- 7) Geiger, C.A., Langer, K., Winkler, B., and Cemic, L., 1988, The synthesis, characterisation and physical properties of end-member garnets in the system (Fe,Mg,Ca,Mn)<sub>3</sub>Al<sub>2</sub>(SiO<sub>4</sub>)<sub>3</sub>. In *High Pressure Geosciences and Material Synthesis, Proceed. XXV. Annual Meeting European High Pressure Research Group*, Ed. Vollstädt, H., Akademie-Verlag Berlin, 193-198.
- 8) Geiger, C.A., and Guidotti, C.V., 1989, Precambrian metamorphism in the Southern Lake Superior region and its bearing on crustal evolution. *Geoscience Wisconsin*, 13, 1-33.
- 9) Geiger, C.A., Winkler, B. and Langer, K., 1989, Infrared spectra of synthetic almandine-grossular and almandine-pyrope garnet solid solutions: Evidence for equivalent site behaviour. *Mineralogical Magazine*. 53, 231-237.
- 10) Cemic, L., Geiger, C.A., Hoyer, W., Koch-Müller, M. and Langer, K., 1990, Piston-cylinder techniques: Pressure and temperature calibration of a pyrophyllite-based assembly by means of DTA measurements, a salt-based assembly, and a cold-sealing encapsulation method. *Neues Jahrbuch für Mineralogie Mh. H. 2*, 49-64.
- 11) Peterson, J.W. and Geiger, C.A., 1990, The Harwood Gneiss: evidence for high P-T, Archean metamorphism in the southern province of the Lake Superior region. *Journal of Geology*. 98, 273-281.
- 12) Geiger, C.A., Langer, K., Bell, D.R., Rossman, G.R. and Winkler, B., 1991, The hydroxal component in synthetic pyrope. *American Mineralogist*. 76, 49-59.
- 13) Olijnyk, H., Paris, E., Geiger, C.A., Lager, G.A., 1991, Compression study of katoite [Ca<sub>3</sub>Al<sub>2</sub>(O<sub>4</sub>H<sub>4</sub>)<sub>3</sub>] and grossular garnet. *Journal of Geophysical Research*. 96, 14,313-14,318.
- 14) Geiger, C.A., Merwin, L., and Sebald, A., 1992, Structural investigations of pyrope garnet using temperature-dependent FTIR and <sup>27</sup>Al and <sup>29</sup>Si MAS NMR spectroscopy. *American Mineralogist*. 77, 713-717.
- 15) Armbruster, T., Geiger, C.A., and Lager, G.A., 1992, Single crystal X-ray refinement of almandine-pyrope garnets at 298 and 100 K. *American Mineralogist*. 77, 512-523.
- 16) O'Neill, B., Bass, J.D., Rossman, G. R., Geiger, C.A., and Lager, K., 1991, Elastic properties of pyrope. *Physics and Chemistry of Minerals*. 17, 617-621.
- 17) Geiger, C.A., Armbruster, Th., Lager, G.A., Jiang, K., Lottermoser, W., and Amthauer, G., 1992, A combined temperature dependent Mössbauer and single crystal X-ray diffraction study of synthetic almandine: Evidence for the Gol'danskii-Karyagin effect. *Physics and Chemistry of Minerals*. 19, 121-126.
- 18) Gillet, Ph., Fiquet, G., Malezieux, J.M., and Geiger, C.A., 1992, High-pressure and high-temperature Raman spectroscopy of end-member garnets: pyrope, grossular and andradite. *European Journal of Mineralogy*. 4, 651-664.
- 19) Wenger, M., Armbruster, T., and Geiger, C.A., 1991, Cation distribution in columbite from the Kings Mountains pegmatite. *N.C. American Mineralogist*. 76, 1897-1904.
- 20) Libourel, G., Geiger, C.A., Merwin, L., and Sebald, A., 1992, <sup>29</sup>Si and <sup>27</sup>Al MAS-NMR spectroscopy of glasses in the system CaSiO<sub>3</sub>-MgSiO<sub>3</sub>-Al<sub>2</sub>O<sub>3</sub>. *Chemical Geology*. 96, 387-397.

- 21) O'Neill, H. St. C., Rubie, D.C., Canil, D., Geiger, C.A., Ross, C.R. II, Seifert, F., Woodland, A.B., 1993, Ferric iron in the upper mantle and in the transition zone assemblages: Implications for relative oxygen fugacities in the mantle. In *Evolution of the Earth and Planets. Geophysical Monograph 74, IUGG, v. 14, 73-88.*
- 22) Armbruster, T., and Geiger, C.A., 1993, Andradite crystal chemistry, dynamic X-site disorder and strain in silicate garnets. *European Journal of Mineralogy. 5, 59-71.*
- 23) Artioli, G., and Geiger, C.A., 1994, The crystal chemistry of pumpellyite: a  $^{57}\text{Fe}$  Mössbauer and X-ray Rietveld refinement study. *Physics and Chemistry of Minerals. 20, 443-453.*
- 24) Geiger, C.A. and Rossman, G.R., 1994, Crystal field stabilization energies of almandine-pyrope and almandine-spessartine garnets determined by FTIR near infrared measurements. *Physics and Chemistry of Minerals. 21, 516-525.*
- 25) Bosenick, A., Geiger, C.A., Schaller, T., and Sebald, A., 1995, An  $^{29}\text{Si}$  MAS NMR and IR spectroscopic investigation of synthetic pyrope-grossular garnet solid solutions. *American Mineralogist. 80, 691-704.*
- 26) Bosenick, A., Geiger, C.A. and Cemic, L., 1996, Heat capacity measurements on synthetic pyrope-grossular garnets between 350 and 1000 K as determined by differential scanning calorimetry. *Geochimica et Cosmochimica Acta. 60, 3215-3227.*
- 27) Geiger, C.A. and Feenstra, A., 1997, Molar volumes of mixing of almandine-pyrope and almandine-spessartine garnets and the crystal chemistry of aluminosilicate garnets. *American Mineralogist. 82, 571-581.*
- 28) Quartieri, S., Antonioli, G., Artioli, G., Geiger, C.A. and Lottici, P.P., 1997, A temperature dependent X-ray absorption fine structure study of dynamic X-site disorder in almandine: a comparison to diffraction data. *Physics and Chemistry of Minerals. 24, 200-205.*
- 29) Geiger, C.A. and Armbruster, T., 1997,  $\text{Mn}_3\text{Al}_2\text{Si}_3\text{O}_{12}$  spessartine and  $\text{Ca}_3\text{Al}_2\text{Si}_3\text{O}_{12}$  grossular garnet: dynamical structural and thermodynamic properties. *American Mineralogist. 82, 740-747.*
- 30) Bosenick, A. and Geiger, C.A., 1997, Powder X-ray diffraction study of synthetic pyrope-grossular garnets between 20 and 295 K: A comparison of thermal expansion and heat capacity. *Journal of Geophysical Research. 102, B10, 22,649-22,657.*
- 31) Kolesov, B.A. and Geiger, C.A., 1997, Raman scattering in silicate garnets: An investigation of their resonance intensities. *Journal of Raman Spectroscopy. 28, 659-662.*
- 32) Quartieri, S., Antonioli, G., Artioli, G., Geiger, C.A., and Lottici, P.P., 1997, Temperature dependence of disorder and correlation effects in the almandine X-site. *Journal de Physique. 7, C2-1157-1158.*
- 33) Kolesov, B.A. and Geiger, C.A., 1998, Raman spectra of silicate garnets. *Physics and Chemistry of Minerals, 25, 142-151.*
- 34) Geiger, C.A., 1998, A powder infrared spectroscopic investigation of garnet binaries in the system  $\text{Mg}_3\text{Al}_2\text{Si}_3\text{O}_{12}$ - $\text{Fe}_3\text{Al}_2\text{Si}_3\text{O}_{12}$ - $\text{Mn}_3\text{Al}_2\text{Si}_3\text{O}_{12}$ - $\text{Ca}_3\text{Al}_2\text{Si}_3\text{O}_{12}$ . *European Journal of Mineralogy. 3, 407-422.*
- 35) Bosenick, A., Geiger, C.A., and Phillips, B., 1999, Local Ca-Mg distribution of Mg-rich pyrope-grossular garnets synthesized at different temperatures revealed by  $^{29}\text{Si}$  NMR MAS spectroscopy. *American Mineralogist, 42, 1422-1433.*
- 36) Geiger, C.A., 1999, Thermodynamics of  $(\text{Fe}^{2+}, \text{Mn}^{2+}, \text{Mg}, \text{Ca})_3\text{Al}_2\text{Si}_3\text{O}_{12}$  Garnet: An analysis and review. *Mineralogy and Petrology. 66, 271-299.*
- 37) Quartieri, S., Antonioli, G., Geiger, C.A., Artioli, G., and Lottici, P.P., 1999, XAFS characterization of the structural site of Yb in synthetic pyrope and grossular garnets. *Physics and Chemistry of Minerals. 26, 251-256.*
- 38) Rodehorst, U., Geiger, C.A. and Armbruster, T., 2002, The crystal structure of synthetic grossular and spessartine between 100 and 600 K and the crystal chemistry of grossular-spessartine solid solutions. *American Mineralogist. 87, 542-549.*
- 39) Zhang, L., Ahsbahs, H., Kutoglu, A., and Geiger, C.A., 1999, Single-crystal hydrostatic compression of synthetic pyrope, almandine, spessartine, grossular and andradite at high pressures. *Physics and Chemistry of Minerals. 27, 52-58.*
- 40) Geiger, C.A. and Armbruster, T., 1999, The crystal structure of a grossular-pyrope garnet solid solution  $(\text{Ca}_{0.9}\text{Mg}_{0.1})_3\text{Al}_2(\text{SiO}_4)_3$  at 295 and 100 K. *Zeitschrift für Kristallographie. 214, 211-215.*

- 41) Boffa Ballaran T., Carpenter, M.A., Geiger, C.A., and Koziol, A., 1999, Local structural heterogeneity in garnet solid solutions. *Physics and Chemistry of Minerals*. 26, 554-569.
- 42) Geiger, C.A., 2000, Volumes of mixing in aluminosilicate garnets: Implications for solid solution behavior. *American Mineralogist*. 85, 893-897.
- 43) Geiger, C.A., Stahl, A., and Rossman, G.R., 1999, Raspberry red grossular from Mexico. *European Journal of Mineralogy*. 11, 1109-1113.
- 44) Geiger, C.A., Stahl, A., and Rossman, G.R., 2000, Single-crystal IR- and UV/VIS-spectroscopic measurements on transition-metal-bearing pyrope: The incorporation of hydroxal in garnet. *European Journal of Mineralogy*. 12, 259-271.
- 45) Geiger, C.A. and Voigtländer, H., 2000, Heat capacity measurements on synthetic Mg- and Fe-cordierite. *Contributions to Mineralogy and Petrology*. 138, 46-50.
- 46) Kolesov, B.A. and Geiger, C.A., 2000, Low-temperature single-crystal Raman spectrum of pyrope. *Physics and Chemistry of Minerals*. 27, 645-649.
- 47) Kolesov, B.A. and Geiger, C.A., 2000, A single-crystal Raman study of the orientation and vibrational states of molecular water in synthetic beryl. *Physics and Chemistry of Minerals*. 27, 557-564.
- 48) Geiger, C.A., Armbruster, T., Khomenko, V., and Quartieri, S., 2000, Cordierite I: The coordination of Fe<sup>2+</sup>. *American Mineralogist*. 85, 1255-1264.
- 49) Kolesov, B.A. and Geiger, C.A., 2000, Cordierite II: The role of CO<sub>2</sub> and H<sub>2</sub>O. *American Mineralogist*. 85, 1265-1274.
- 50) Quartieri, S., Chaboy, J., Antonioli, G., and Geiger, C.A., 1999, XAFS characterization of the structural site of Yb in synthetic pyrope and grossular garnets. II: XANES full multiple scattering calculations at the Yb L<sub>I</sub>- and L<sub>II</sub>-edges. *Physics and Chemistry of Minerals*. 27, 88-94.
- 51) Bosenick, A., Dove, M.T., and Geiger, C.A., 2000, Simulation studies of pyrope-grossular solid solutions. *Physics and Chemistry of Minerals*. 27, 398-418.
- 52) Bosenick, A., Dove, M.T., Heine, V., and Geiger, C.A., 2001, Scaling of thermodynamic mixing properties in solid solution minerals. *Physics and Chemistry of Minerals*. 28, 177-187.
- 53) Geiger, C.A., Rager, H. and Czank, M., 2000, Cordierite III: The coordination and concentration of Fe<sup>3+</sup>. *Contributions to Mineralogy and Petrology*. 140, 344-352.
- 54) Khomenko, V., Langer, K. and Geiger, C.A., 2001, Structural allocation of iron ions in cordierite: Spectroscopic study. *Contributions to Mineralogy and Petrology*. 141, 381-396.
- 55) Kolesov, B.A., Geiger, C.A. and Armbruster, T., 2001, The dynamic properties of zircon studied by single-crystal X-ray diffraction and Raman spectroscopy. *European Journal of Mineralogy*. 13, 939-948.
- 56) Kolesov, B.A. and Geiger, C.A., 2004, The Raman spectra of Fe-Mg olivines. *Physics and Chemistry of Minerals*. 31, 142-154.
- 57) Taran, M.N, Langer, K., and Geiger, C.A., 2002, Single-crystal electronic absorption spectroscopy on chromium, cobalt and vanadium-bearing synthetic pyropes at different temperatures and pressures. *Physics and Chemistry of Minerals*. 29, 362-368.
- 58) Rodehorst U., Carpenter, M.A., Boffa Ballaran, T. and Geiger, C.A., 2004, Local structural heterogeneity, mixing behaviour and saturation effects in the grossular-spessartine solid solution. *Physics and Chemistry of Minerals*. 31, 387-404
- 59) Kolesov, B.A. and Geiger, C.A., 2002, Raman spectroscopic study of H<sub>2</sub>O in bikitaite: "One-dimensional" ice. *American Mineralogist*. 87, 1426-1431.
- 60) Kolesov, B.A. and Geiger, C.A., 2004, A temperature-dependent single-crystal Raman spectroscopic study of fayalite: evidence for phonon-magnetic excitation coupling. *Physics and Chemistry of Minerals*. 31, 155-161.
- 61) Rager, H, Geiger, C.A., and Stahl, A., 2003, Ti(III) in pyrope: A single-crystal electron paramagnetic resonance study. *European Journal of Mineralogy*. 15, 697-699.
- 62) Geiger, C.A., Grodzicki, M., and Amthauer, G., 2003, The crystal chemistry and Fe<sup>II</sup> site properties of aluminosilicate garnet solid solutions as revealed by Mössbauer spectroscopy and electronic structure calculations. *Physics and Chemistry of Minerals*. 30, 280-292.
- 63) Artioli, G., Geiger, C.A., and Dapiaggi, M., 2003, The crystal chemistry of julgoldite-Fe<sup>+3</sup> from Bombay, India, studied using synchrotron XRPD and <sup>57</sup>Fe Mössbauer spectroscopy. *American Mineralogist*. 88, 1084-1090.

- 64) Geiger, C.A. and Grams, M., 2003, Cordierite IV: Structural heterogeneity and energetics of natural Mg-Fe solid solutions. *Contributions to Mineralogy and Petrology*. 145, 752-764.
- 65) Kolesov, B.A. and Geiger, C.A., 2003, Molecules in the SiO<sub>2</sub>-clathrate melanophlogite: A single-crystal Raman study. *American Mineralogist*. 88, 1364-1368.
- 66) Matveev, S., Portnyagin, M., Ballhaus, C., Brooker, R. and Geiger, C.A., 2005, FTIR spectrum of phenocryst olivine as an indicator of silica saturation in magmas. *Journal of Petrology*, 46(3), 603-614.
- 67) Sani, A., Quartieri, S., Boscherini, F., Antonioli, G., Feenstra, A., and Geiger, C.A., 2004, Atomistic-scale structural and dynamic properties of almandine-spessartine solid solutions: An XAFS study at the Fe and Mn K-edges. *European Journal of Mineralogy*. 16, 801-808.
- 68) Dapiaggi, M., Geiger, C.A., and Artioli, G., 2005, Microscopic strain in synthetic pyrope-grossular solid solutions determined by synchrotron X-ray powder diffraction at 5 K: The relationship to enthalpy of mixing behavior. *Letter - American Mineralogist*. 90, 506-509.
- 69) Kolesov, B.A. and Geiger, C.A., 2005, The vibrational spectrum of synthetic hydrogrossular (Katoite) Ca<sub>3</sub>Al<sub>2</sub>(O<sub>4</sub>H<sub>4</sub>)<sub>3</sub>: A low temperature IR and Raman spectroscopic study. *American Mineralogist*. 90, 1335-1341.
- 70) Rinaldi, R., Gatta, G.D., Artioli, G., Knight, K.S., and Geiger, C.A., 2005, Crystal chemistry, cation ordering and thermoelastic behaviour of CoMgSiO<sub>4</sub> olivine at high temperature as studied by in-situ neutron powder diffraction. *Physics and Chemistry of Minerals*. 32, 655-664.
- 71) Paukov, I.E., Kovalevskaya, Yu, A., Rahmoun, N-S. and Geiger, C.A., 2006, A low temperature heat-capacity study of synthetic anhydrous Mg-cordierite (Mg<sub>2</sub>Al<sub>4</sub>Si<sub>5</sub>O<sub>18</sub>). *American Mineralogist*. 91, 35-38.
- 72) Dachs, E. and Geiger, C.A., 2006, Heat capacities and vibrational entropies of mixing of pyrope-grossular (Mg<sub>3</sub>Al<sub>2</sub>Si<sub>3</sub>O<sub>12</sub>-Ca<sub>3</sub>Al<sub>2</sub>Si<sub>3</sub>O<sub>12</sub>) garnet solid solutions: A low temperature calorimetric and thermodynamic investigation. *American Mineralogist*. 91, 894-906.
- 73) Kolesov, B.A. and Geiger, C.A., 2006, Behavior of H<sub>2</sub>O molecules in the channels of natrolite and scolecite: A Raman and IR spectroscopic investigation of hydrous microporous silicates. *American Mineralogist*. 91, 1039-1048.
- 74) Paukov, I.E., Kovalevskaya, Yu.A., Rahmoun, N.-S. and Geiger, C.A., 2007, The heat capacity of hydrous cordierite at low temperatures: The thermodynamic behavior of the H<sub>2</sub>O molecule in hydrous micro and nanoporous silicates. *American Mineralogist*. 92, 388-396.
- 75) Weber, S-U., Grodzicki, M., Geiger, C.A., Lottermoser W., Tippelt, G., Redhammer, G.J., Bernroider, M. and Amthauer, G., 2007, <sup>57</sup>Fe Mössbauer measurements and electronic structure calculations on natural lawsonites. *Physics and Chemistry of Minerals*. 34, 1-9.
- 76) Dachs, E., Geiger, C.A., von Seckendorff, V., and Grodzicki, M., 2007, A low-temperature calorimetric study of synthetic (forsterite-fayalite) {(Mg<sub>2</sub>SiO<sub>4</sub>-Fe<sub>2</sub>SiO<sub>4</sub>)} solid solutions: An analysis of vibrational, magnetic and electronic contributions to the molar heat capacity and entropy of mixing. *Journal of Chemical Thermodynamics*. 39, 906-933.
- 77) Dachs, E. and Geiger, C.A., 2007, Entropies of mixing and subsolidus phase relations of forsterite-fayalite (Mg<sub>2</sub>SiO<sub>4</sub>-Fe<sub>2</sub>SiO<sub>4</sub>) solid solution. *Letter - American Mineralogist*. 92, 699-702.
- 78) Dachs, E. and Geiger, C.A., 2008, Low-temperature heat capacity of synthetic Fe and Mg-cordierite: Thermodynamic properties and phase relations in the system FeO-Al<sub>2</sub>O<sub>3</sub>-SiO<sub>2</sub>-(H<sub>2</sub>O). *European Journal of Mineralogy*. 20, 47-62.
- 79) **Geiger, C.A., 2008, Silicate garnet: A micro to macroscopic (re)view. Invited - C.V. Guidotti Memorial Volume, American Mineralogist. 93, 360-372.**
- 80) Kelsey, K.E., Stebbins, J.F., Du, L-S., Mosenfelder, J.L., Asimow, P.D. and Geiger, C.A., 2008, Cation order/disorder behavior and crystal chemistry of pyrope-grossular garnets: An <sup>17</sup>O 3QMAS and <sup>27</sup>Al MAS NMR spectroscopic study. *American Mineralogist*. 93, 134-143.
- 81) Geiger, C.A., Dachs, E., and Nagashima, M., 2008, Heat capacity and entropy of melanophlogite: Molecule-containing porosils in nature. *Letter - American Mineralogist*. 93, 1179-1182.
- 82) Nagashima, M., Rahmoun, N-S., Alekseev, E.V., Geiger, C.A., Armbruster, T. and Akasaka. M., 2008, Crystal chemistry of macfallite: Relationships to sursassite and pumpellyite. *American Mineralogist*. 93, 1851-1857.

- 83) Geiger, C.A., Rahmoun, N-S. and Heide, K., in press, Cordierite V: A High-Temperature Microporous Silicate with Occluded Molecular Species. *Geochimica et Cosmochimica Acta*.
- 84) Dachs, E., Geiger, C.A., Withers, A.C., and Essene, E.J., 2009, A calorimetric investigation of spessartine: vibrational and magnetic heat capacity. *Geochimica et Cosmochimica Acta*. 73, 3393-3409.
- 85) Nagashima, M., Geiger, C.A. and Akasaka, M., 2009, A crystal-chemical investigation of clinzoisite synthesized along the join  $\text{Ca}_2\text{Al}_3\text{Si}_3\text{O}_{12}(\text{OH})$ - $\text{Ca}_2\text{Al}_2\text{CrSi}_3\text{O}_{12}(\text{OH})$ . *American Mineralogist*. 94, 1351-1360.
- 86) Geiger, C.A. and Dachs, E., 2009, Quasi-ice-like  $C_p$  behavior of molecular  $\text{H}_2\text{O}$  in hemimorphite  $\text{Zn}_4\text{Si}_2\text{O}_7(\text{OH})_2 \cdot \text{H}_2\text{O}$ :  $C_p$  and entropy of  $\text{H}_2\text{O}$  in confined in microporous silicates. *Letter - American Mineralogist*. 94, 634-637.
- 87) Geiger, C.A., 2009, A  $^{57}\text{Fe}$  Mössbauer spectroscopic study of sugilite  $\text{KNa}_2(\text{Fe}^{3+}, \text{Mn}^{3+}, \text{Al})_2\text{Li}_3\text{Si}_{12}\text{O}_{30}$ . *Canadian Mineralogist*. 47, 927-931.
- 88) Dachs, E. and Geiger C.A., 2009, Heat-capacity behavior of hemimorphite,  $\text{Zn}_4\text{Si}_2\text{O}_7(\text{OH})_2 \cdot \text{H}_2\text{O}$ , and its dehydrated analogue  $\text{Zn}_4\text{Si}_2\text{O}_7(\text{OH})_2$ : A calorimetric and thermodynamic investigation of their phase transitions, *European Journal of Mineralogy*. 21, 971-983.
- 89) Suleimanov, E.V., Golubev A.V., Alekseev, E.V., Geiger, C.A., Depmeier, W., and Krivovichev, V.G., 2010, A calorimetric and thermodynamic investigation of uranyl molybdate  $\text{UO}_2\text{MoO}_4$ . *Journal of Chemical Thermodynamics*. 42, 873-878.
- 90) Geiger, C.A., Dachs, E., Dalconi, M.C., Artioli, G., 2010, Molecular  $\text{H}_2\text{O}$  in armenite,  $\text{BaCa}_2\text{Al}_6\text{Si}_9\text{O}_{30} \cdot 2\text{H}_2\text{O}$ , and epididymite,  $\text{Na}_2\text{Be}_2\text{Si}_6\text{O}_{15} \cdot \text{H}_2\text{O}$ : Heat capacity, entropy and local-bonding behavior of confined  $\text{H}_2\text{O}$  in microporous silicates. *Geochimica et Cosmochimica Acta*. 74, 5202-5215.
- 91) Geiger, C.A., Alekseev, E., Lazic, B., Fisch, M., Armbruster, T., Langner, R., Fechtelkord, M., Kim, N., Pettke, T. and Weppner, W., 2011, Crystal chemistry and stability of “ $\text{Li}_7\text{La}_3\text{Zr}_2\text{O}_{12}$ ” garnet: A fast lithium-ion conductor. *Inorganic Chemistry*. 50, 1089-1097.
- 92) Dachs, E., Geiger, C.A., Benisek, A., and Grevel, K-D., 2012, Grossular: A crystal-chemical, calorimetric, and thermodynamic study. *American Mineralogist*. 97, 1299-1313.
- 93) Geiger, C.A. and Grodzicki, M., 2012, A  $^{57}\text{Fe}$  Mössbauer spectroscopic study of sogdianite: An example of a symmetric electric field gradient around  $\text{Fe}^{3+}$ . *Physics and Chemistry of Minerals*. 39, 73-78.
- 94) Geiger, C.A., 2012, A low temperature IR spectroscopic investigation of the  $\text{H}_2\text{O}$  molecules in the zeolite mesolite. *European Journal of Mineralogy*. 24, 439-445.
- 95) Geiger C.A., Dachs, E. and Benisek, A., 2012, Thermodynamic behavior and properties of katoite (hydrogrossular): A calorimetric study. *Letter - American Mineralogist*. 97, 1252-1255.
- 96) Geiger, C.A., Gatta, G.D., Xue, X., and McIntyre, G.J., 2012, **A neutron/X-ray diffraction and IR and  $^1\text{H}/^{29}\text{Si}$  NMR spectroscopic investigation of armenite: Behavior of extra framework Ca cations and  $\text{H}_2\text{O}$  molecules in microporous silicates. Invited Paper - F. Liebau Memorial Volume, *Zeitschrift für Kristallographie*. 227, 411-426.**
- 97) Dachs, E., Geiger, C.A., and Benisek, A., 2012, Almandine: Lattice and non-lattice heat capacity behavior and standard thermodynamic properties. *American Mineralogist*. 97, 1771-1782.
- 98) Geiger, C.A., 2013, Static disorders of atoms and experimental determination of Debye temperature in pyrope: Low- and high-temperature single-crystal X-ray diffraction study -- Discussion. *American Mineralogist*. 98, 780-782.
- 99) Lelet, M.I., Ogurtsova, O.V., Suleimanov, E.V., Geiger, C.A., Depmeier, W., and Alekseev, E.V., 2013, A calorimetric and thermodynamic investigation of Potassium Uranyl Tungstate  $\text{K}_2[(\text{UO}_2)(\text{W}_2\text{O}_8)]$ . *Journal of Chemical Thermodynamics*. 57, 430-435.
- 100) Rettenwander, D., Geiger, C.A., and Amthauer, G., 2013, Synthesis and crystal chemistry of the fast Li-ion conductor  $\text{Li}_7\text{La}_3\text{Zr}_2\text{O}_{12}$  doped with Fe. *Inorganic Chemistry*. 52, 8005-8009.
- 101) Dachs, E., Geiger, C.A., Benisek, A., and Grodzicki, M., 2014, Thermodynamic mixing properties and behavior of almandine-spessartine garnet solid solutions. *Geochimica et Cosmochimica Acta*. 125, 210-224.
- 102) Geiger, C.A., 2013, **Garnet: A key phase in nature, the laboratory and in technology. Invited Paper, *Elements*. 9, 447-452.**

- 103) Dachs, E., Geiger, C.A. and Benisek, A., 2014, Thermodynamic mixing properties and behavior of grossular-spessartine,  $(Ca_xMn_{1-x})_3Al_2Si_3O_{12}$ , solid solutions. *Geochimica et Cosmochimica Acta*. 141, 294-302.
- 104) Lelet, M.I., Suleimanov, E.V., Golubev, A.V., Geiger, C.A., Depmeier, W., Bosbach, D., and Alekseev, E.V., 2014, Thermodynamic properties and behavior of  $A_2[(UO_2)(MoO_4)_2]$  compounds with A = Li, Na, K, Rb, and Cs. *Journal of Chemical Thermodynamics*. 79, 205-214.
- 105) Rettenwander, D., Blaha, P., Laskowski, R., Schwarz, K., Bottke, P., Wilkening, M., Geiger, C.A., and Amthauer, G., 2014, DFT study of the role of  $Al^{3+}$  in the fast ion-conductor  $Li_{7-3x}Al^{3+x}La_3Zr_2O_{12}$  garnet. *Chemistry of Materials*. 26 (8), 2617-2623.
- 106) Rettenwander, D., Geiger, C.A., Tribus, M., Tropper, P., and Amthauer, G., 2014, A synthesis and crystal chemical study of the fast ion conductor  $Li_{7-3x}Ga_xLa_3Zr_2O_{12}$  with x = 0.08 to 0.84. *Inorganic Chemistry*. 53, 6264-6269.
- 107) Palke, A.C., Stebbins, J.F., Geiger, C.A., and Tippelt, G., 2015, Cation order-disorder in Fe-bearing pyrope and grossular garnets: An  $^{27}Al$  and  $^{29}Si$  MAS NMR and  $^{57}Fe$  Mössbauer spectroscopy study. *American Mineralogist*. 100, 536-547.
- 108) Palke, A.C., Geiger, C.A., and Stebbins, J.F., 2015, An investigation of local X-cation order-disorder in garnet from a grosspyrite using paramagnetically shifted  $^{27}Al$  and  $^{29}Si$  MAS NMR resonances. *European Journal of Mineralogy*. 27, 463-470.
- 109) Milani S., Nestola, F., Alvaro, M., Pasqual, D., Mazzucchelli, M.L., Domeneghetti, M.C., and Geiger, C.A., 2015, Diamond-garnet geobarometry: The role of garnet compressibility and expansivity. *Lithos*. 227, 140-147.
- 110) Rettenwander, D., Geiger, C.A., Tribus, M., Tropper, P., Wagner, R., Tippelt, G., Lottermoser, W., and Amthauer, G., 2015, The solubility and site preference of  $Fe^{3+}$  in  $Li_{7-3x}Fe^{3+x}La_3Zr_2O_{12}$  garnets. *Journal of Solid State Chemistry*. 230, 266-271.
- 111) **Bebout, G.E., Lazzeri, K.E., and Geiger, C.A., 2015, Pathways for nitrogen cycling in Earth's crust and upper mantle: A review and new results for microporous beryl and cordierite. American Mineralogist. Invited - Centennial Paper. 101, 7-24.**
- 112) Lelet, M.I., Suleimanov, E.V., Golubev, A.V., Geiger, C.A., W., Bosbach, D., and Alekseev, E.V., 2015, A calorimetric and thermodynamic investigation of  $A_2[(UO_2)_2(MoO_4)O_2]$  compounds with A = K and Rb and calculated phase relations in the system  $(K_2MoO_4-UO_3-H_2O)$ . *Journal of Chemical Thermodynamics*. 90, 270-276.
- 113) Lazzeri, K.E., Bebout, G.E., and Geiger, C.A., 2016, Nitrogen and carbon concentrations and isotopic compositions of the silica clathrate melanophlogite. *American Mineralogist. Letter*. 102, 686-689.
- 114) **Palke, A.C. and Geiger, C.A., 2016, Trivalent transition-metal cations and local structure in synthetic pyrope- and grossular-rich solid solutions investigated by  $^{27}Al$  and  $^{29}Si$  MAS NMR spectroscopy. Invited - Thomas Armbruster volume. European Journal of Mineralogy. 28, 179-187.**
- 115) Geiger, C.A., Brearley, A.J., Dachs, E., Tippelt, G., and Rossman, G.R., submitted, Almandine: Synthesis, Crystal Chemistry, Stoichiometry and Defects, Solid-Inclusion Phases, and Physical Properties. *American Mineralogist*.
- 116) **Geiger, C.A., 2016, A tale of two garnets: The role of solid solution in the development towards a modern mineralogy. American Mineralogist. Invited - Centennial Paper. 101, 1735-1749.**
- 117) Lelet, M.I., Borodulina, M.L., Suleimanov, E.V., Geiger, C.A., Bosbach, D., and Alekseev, E.V., 2017, A calorimetric investigation of  $A_2[(UO_2)_2(WO_5)O]$  compounds with A = K, Rb and Cs and calculated phase relations in the  $K_2WO_4-UO_3-H_2O$  and  $K_2MoO_4-K_2WO_4-UO_3-H_2O$  Systems. *Journal of Chemical Thermodynamics*. 112, 23-30.
- 118) Geiger, C.A. and Dachs, E., 2018, *Journal of Metamorphic Geology*. Recent developments and the future of low-*T* calorimetric investigations in the Earth sciences: Consequences for thermodynamic calculations and databases. 36, 283-295.
- 119) Geiger, C.A. and Rossman, G.R., 2018, IR spectroscopy and OH in silicate garnet: The long quest to document the hydrogarnet substitution. *American Mineralogist*. 103, 384-393.

- 120) Geiger, C.A., Dachs, E., Vielreicher, N. and Rossman, G.R., 2018, Heat capacity behavior of andradite: A multi-sample and -methodological investigation. *European Journal of Mineralogy*. 4, 681-694.
- 121) Dachs, E. and Geiger, C.A., 2019 - in press, A calorimetric heat capacity investigation of grossular-andradite garnets: Entropy of mixing behavior and a revised value for the enthalpy of formation of andradite. *European Journal of Mineralogy*. 10.1127/ejm/2019/0031-2827.
- 122) Geiger, C.A., Grodzicki, M., and Dachs, E., submitted, Magnetic behavior of olivine and garnet substitutional solid solutions: A structural, crystal-chemical, and thermodynamic analysis. *American Mineralogist*. John Valley Volume.
- 123) Geiger, C.A. and Demin, S., in prep., Synthesis and characterization of grossular  $\text{Ca}_3\text{Al}_2(\text{SiO}_4)_3$ -andradite  $\text{Ca}_3\text{Fe}_2(\text{SiO}_4)_3$  garnet solid solutions. *European Journal of Mineralogy*.
- 124) Lelet, M.I, Borodulina, M.L., Suleimanov, E.V., Geiger, C.A., Bosbach, D., and Alekseev, E.V., 2019 - submitted, A calorimetric and thermodynamic investigation of cesium uranyl tungstate  $\text{Cs}_8(\text{UO}_2)_4(\text{WO}_4)_4(\text{WO}_5)_2$ . *Journal of Chemical Thermodynamics*.

### **Invited Articles in Short Course Volumes / Books / Encyclopedias**

- 1) Artioli, G., Besson, J.M., Dove, M.T., Geiger, C.A., Rinaldi, R., and Schäfer, W., 1996, Neutron Scattering in the Earth Sciences. In *Scientific proposals for neutron scattering with present and future sources*. European Science Foundation and European Neutron Scattering Association Report, 94-108.
- 2) Geiger, C.A., 1997, Thermodynamics in Mineralogy: A Macroscopic Approach. In 1st Kiel Workshop on Computational Mineralogy, Universität Kiel, B. Winkler, Ed., 27-34.
- 3) Geiger, C.A., 1997, The P-T stability and thermodynamic properties of minerals. In *Proceedings for CCAM Workshop "How can ab initio calculations be an effective tool for the study of mineral properties?"* Lyon, France, V. Heine and B. Winkler, Eds., 69-79.
- 4) Geiger, C.A., 1999, Calorimetry. In *Encyclopedia of Geochemistry*, Clare P. Marshall and Rhodes W. Fairbridge, Eds., Kluwer Academic Publishers, Boston, 58.
- 5) Geiger, C.A., 1999, Experimental Mineralogy and Petrology. In *Encyclopedia of Geochemistry*, Clare P. Marshall and Rhodes W. Fairbridge, Eds., Kluwer Academic Publishers, Boston, 237-239.
- 6) Geiger, C.A., 2001, Thermodynamic mixing properties of binary oxide and silicate solid solutions determined by direct measurements: The role of strain. In *European Notes in Mineralogy - Solid solutions in silicate and oxide systems*, C.A. Geiger, Ed., v. 3, 71-100.
- 7) Geiger, C.A., 2001, Solid solutions: Background, history and scientific perspective. In *European Notes in Mineralogy - Solid solutions in silicate and oxide systems*, C.A. Geiger, Ed., v. 3, 3-7.
- 8) Geiger, C.A. and Kolesov, B.A., 2002, Microscopic-macroscopic relationships in silicates: Examples from IR and Raman spectroscopy and heat capacity measurements. In *European Notes in Mineralogy - Energy Modeling in Minerals*, C.-M. Gramaccioli, Ed., v. 4, 347-387.
- 9) Geiger, C.A., 2004, Spectroscopic investigations relating to the structural, crystal-chemical and lattice-dynamic properties of  $(\text{Fe}^{2+}, \text{Mn}^{2+}, \text{Mg}, \text{Ca})_3\text{Al}_2\text{Si}_3\text{O}_{12}$  garnet: A review and analysis. In *European Notes in Mineralogy - Spectroscopic Methods in Mineralogy*, E. Libowitzky & A. Beran, Eds., v. 6, 589-645.
- 10) Geiger, C.A., 2004, An introduction to spectroscopic methods in the mineral sciences and geochemistry. In *European Notes in Mineralogy - Spectroscopic Methods in Mineralogy*, E. Libowitzky & A. Beran, Eds., v. 6, 1-42.
- 11) Geiger, C.A., 2016, Alexander Newton Winchell and the modern mineral sciences. *The Outcrop*, University of Wisconsin, Madison, Wisconsin. 12-13.
- 12) Geiger, C.A., and Kawamoto, T., 2018, Experimental mineralogy and petrology. In *Encyclopedia of Geochemistry*. Series Title: *Encyclopedia of Earth Science Series*. W.M. White (ed.), Springer, 471-476.

### **Books Edited**

1) Oxide and Silicate Solid Solutions of Geological Importance, 2001, European Mineralogical Union Notes in Mineralogy, C.A. Geiger, Ed., v. 3, Eötvös University Press. 465 p.