

List of publications

Articles in refereed journals

1. Keppler H (1989) A new method for the generation of N₂-containing fluids in high-pressure experiments. *Eur J Mineral* 1: 135 - 137
2. Keppler H (1989) The influence of the fluid phase composition on the solidus temperatures in the haplogranite system NaAlSi₃O₈-KAlSi₃O₈-SiO₂-H₂O-CO₂. *Contrib Mineral Petrol* 102: 321 - 327
3. Keppler H (1990) Ion exchange reactions between dehydroxylated micas and salt melts and the crystal chemistry of the interlayer cation in micas. *Am Mineral* 75: 529 - 538
4. Keppler H, Wyllie PJ (1990) Role of fluids in transport and fractionation of uranium and thorium in magmatic processes. *Nature* 348: 531 - 533
5. Keppler H, Wyllie PJ (1991) Partitioning of Cu, Sn, Mo, W, U, and Th between melt and aqueous fluid in the systems haplogranite-H₂O-HCl and haplogranite-H₂O-HF. *Contrib Mineral Petrol* 109: 139 - 150.
6. Keppler H (1992) Crystal field spectra and geochemistry of transition metal ions in silicate melts and glasses. *Am Mineral* 77: 62 - 75.
7. Schaller T, Dingwell DB, Keppler H, Knöller W, Merwin L, Sebald A (1992) Fluorine in silicate glasses: a multinuclear NMR study. *Geochim Cosmochim Acta* 56: 701 - 707
8. Kümmerlen J, Merwin M, Sebald A, Keppler H (1992) The structural role of H₂O in sodium silicate glasses: results from ²⁹Si and ¹H NMR spectroscopy. *J Phys Chem* 96: 6405 - 6410.
9. Kümmerlen J, Merwin M, Sebald A, Keppler H (1993) The structural role of H₂O in sodium silicate glasses: ¹H and ²⁹Si evidence. *Bull Magn Res* 14: 278 - 281
10. Keppler H, Rubie DC (1993) Pressure-induced coordination changes of transition-metal ions in silicate melts. *Nature* 364: 54 - 56.

11. Keppler H (1993) Influence of fluorine on the enrichment of high field strength trace elements in granitic rocks. *Contrib Mineral Petrol.* 114: 479 - 488.
12. Keppler H, Bagdassarov NS (1993) High temperature FTIR spectra of water in rhyolite melt to 1300 °C. *Am Mineral.* 78: 1325 - 1328
13. Saini-Eidukat B, Kucha H, Keppler, H (1994) Hibbingite, $\gamma\text{-Fe}_2(\text{OH})_3\text{Cl}$, a new mineral from the Duluth Complex, Minnesota with implications for oxidation of iron-bearing compounds and transport of metals. *Am Mineral.* 79: 555 - 561.
14. Keppler H (1994) Partitioning of phosphorus between melt and fluid in the system haplogranite- H_2O - P_2O_5 . *Chemical Geology* 117: 343 - 353.
15. Kravchuk IF, Keppler H (1994) Distribution of chloride between aqueous fluid and felsic melts at 2 kbars and 800 °C. *Eur J Mineral* 6: 913 - 923.
16. Keppler H, McCammon C, Rubie D (1994) Crystal-field and charge-transfer spectra of $(\text{Mg,Fe})\text{SiO}_3$ perovskite. *Am Mineral* 79: 1215 - 1218.
17. Sterner SM, Hall D, Keppler H (1995) Compositional reequilibration of fluid inclusions in quartz. *Contrib Mineral Petrol* 119: 1 - 15.
18. McCammon C, Pring A, Keppler H, Sharp T (1995) A study of bernalite, $\text{Fe}(\text{OH})_3$, using Mössbauer spectroscopy, optical spectroscopy and transmission electron microscopy. *Phys Chem Minerals* 22: 11 - 20.
19. Shen A, Keppler H (1995) Infrared spectroscopy of hydrous silicate melts to 1000 °C and 10 kbars: direct observation of water speciation in a diamond anvil cell. *Am Mineral* 80: 1335 - 1338.
20. Ross CR, Keppler H, Canil C, O'Neill HStC (1996) Structure and crystal field spectra of $\text{Co}_3\text{Al}_2(\text{SiO}_4)_3$ and $(\text{Mg,Ni})_3\text{Al}_2(\text{SiO}_4)_3$ garnet. *Am Mineral* 81: 61 - 66.
21. Keppler H, McCammon C (1996) Crystal field and charge transfer spectrum of $(\text{Mg,Fe})\text{SiO}_3$ majorite. *Phys Chem Minerals* 23: 94 - 98.

22. Keppler H (1996) Constraints from partitioning experiments on the composition of subduction-zone fluids. *Nature* 380: 237 - 240.
23. Kohlstedt DL, Keppler H, Rubie DC (1996) Solubility of water in the α , β , and γ phases of $(\text{Mg,Fe})_2\text{SiO}_4$. *Contrib Mineral Petrol* 123: 345 - 357.
24. Zotov N, Keppler H, Hannon A, Soper A (1996) The effect of water on the structure of silicate glasses - a neutron diffraction study. *J Non-Crystalline Solids* 202: 153 - 163.
25. Keppler H. (1996) The investigation of phase transitions by electronic absorption spectroscopy. *Phys Chem Minerals* 23: 288 - 296.
26. Rauch M, Keppler H, Häfner W, Poe B, Wokaun A (1996) A pressure-induced phase transition in MgSiO_3 -rich garnet revealed by Raman spectroscopy. *Am Mineral* 81: 1289 - 1292.
27. Shen A, Keppler H (1997) Direct observation of complete miscibility in the albite- H_2O system. *Nature* 385: 710 - 712.
28. Linnen RL, Keppler H (1997) Columbite solubility in granitic melts: Consequences for the enrichment and fractionation of Nb and Ta in the earth's crust. *Contrib Mineral Petrol* 128: 213 - 227.
29. Lu R, Keppler H (1997) Water solubility in pyrope to 100 kbar. *Contrib Mineral Petrol* 129: 35 - 42.
30. Zotov N, Keppler H (1998) The structure of sodium tetrasilicate glass from neutron diffraction, reverse Monte Carlo simulations and Raman spectroscopy. *Phys Chem Minerals* 25: 259 - 267.
31. Nowak M, Keppler H (1998) The influence of water on the environment of transition metals in silicate glasses. *Am Mineral* 83: 43 - 50.
32. Zotov N, Keppler H (1998) The influence of water on the structure of hydrous sodium tetrasilicate glasses. *Am Mineral* 83: 823 - 834.

33. Zotov N, Delaplane RG, Keppler H (1998) Structural changes in sodium tetrasilicate glass around the liquid-glass transition: a neutron diffraction study. *Phys Chem Minerals* 26: 107 - 110.
34. Bureau H, Keppler H (1999) Complete miscibility between silicate melts and hydrous fluids in the upper mantle: experimental evidence and geochemical implications. *Earth and Planetary Science Letters* 165: 187 - 196.
35. Keppler H, Bagdassarov N (1999) The speciation of Ni and Co in silicate melts from optical absorption spectra to 1500 °C. *Chemical Geology* 158: 105 - 115.
36. Keppler H (1999) Experimental evidence for the source of excess sulfur in volcanic eruptions. *Science* 284: 1652 - 1654.
37. Zotov N, Ebbsjö I, Timpel D, Keppler H (1999) Calculation of Raman spectra and vibrational properties of silicate glasses: comparison between Na₂Si₄O₉ and SiO₂ glasses. *Physical Review B* 60: 6383 - 6397.
38. Sowerby JR, Keppler H (1999) Water speciation in rhyolitic melt determined by in-situ infrared spectroscopy. *Am Mineral* 84: 1843 - 1849; Erratum in *American Mineralogist* 85 (2000): 880.
39. Veksler IV, Keppler H (2000) Partitioning of Mg, Ca, and Na between carbonatite melt and hydrous fluid at 0.1 - 0.2 GPa. *Contrib Mineral Petrol* 138: 27 - 34.
40. Keppler H, Rauch M (2000) Water solubility in nominally anhydrous minerals measured by FTIR and ¹H NMR. *Phys Chem Minerals* 27: 371 - 376.
41. Zotov N, Keppler H (2000) In-situ Raman spectra of dissolved silica species in aqueous fluids to 900 °C and 14 kbar. *Am Mineral* 85: 600 - 604.
42. Bolfan-Casanova N, Keppler H, Rubie DC (2000) Water partitioning between nominally anhydrous minerals in the MgO-SiO₂-H₂O system up to 24 GPa: Implications for the distribution of water in the Earth's mantle. *Earth Planet Sci Lett* 182: 209 - 221.

43. Bureau H, Keppler H, Metrich N (2000) Volcanic degassing of bromine and iodine: experimental data and applications to stratospheric chemistry. *Earth Planet Sci Lett* 183: 51 - 60.
44. Zotov N, Keppler H (2002) Silica speciation in aqueous fluids at high pressures and high temperatures. *Chem Geol* 184: 71 – 82.
45. Schmidt BC, Keppler H (2002) Experimental evidence for high noble gas solubilities in silicate melts under mantle pressures. *Earth Planet Sci Lett* 195: 277 – 290.
46. Sowerby JR, Keppler H (2002) The effect of fluorine, boron and excess sodium on the critical curve in the albite-H₂O system. *Contrib Mineral Petrol* 143: 32-37.
47. Bolfan-Casanova N, Keppler H, Rubie DC (2002) Hydroxyl in MgSiO₃ akimotoite: A polarized and high-pressure IR study. *Am Mineral* 87: 603 – 608.
48. Rauch M, Keppler H (2002) Water solubility in orthopyroxene. *Contrib Mineral Petrol* 143: 525 – 536.
49. Bolfan-Casanova N, Mackwell S, Keppler H, McCammon CA, Rubie DC (2002) Pressure dependence of H solubility in magnesiowustite up to 25 GPa: Implications for the storage of water in the Earth's lower mantle. *Geophys Res Lett* 29: 1029 - 1032.
50. Linnen RL, Keppler H (2002) Melt composition control of Zr/Hf fractionation in magmatic processes. *Geochim Cosmochim Acta* 66: 3293 – 3301.
51. Sierralta M, Nowak M, Keppler H (2002) The influence of composition on the bulk diffusivity of carbon dioxide in Na aluminosilicate melts. *Am Mineral* 87: 1710 – 1716.
52. Keppler H, Wiedenbeck M, Shcheka SS (2003) Carbon solubility in olivine and the mode of carbon storage in the Earth's mantle. *Nature* 424: 414 – 416.

53. Bolfan-Casanova N, Keppler H, Rubie DC (2003) Water partitioning at the 660 km discontinuity and evidence for very low water solubility in magnesium silicate perovskite. *Geophys Res Lett* 30: Article number 1905.
54. Keppler H (2003) Water solubility in carbonatite melts. *Am Mineral* 88: 1822 – 1824.
55. Linnen RL, Keppler H, Sterner SM (2004) In situ measurements of the H₂O/CO₂ ratio of fluid inclusions by infrared spectroscopy. *Canadian Mineral* 42: 1275-1282
56. Audétat A, Keppler H (2004) Viscosity of fluids in subduction zones. *Science* 303: 513 – 516.
57. Bromiley GD, Keppler H (2004) An experimental investigation of hydroxyl solubility in jadeite and Na-rich clinopyroxenes. *Contrib Mineral Petrol* 147: 189 – 200
58. Bromiley GD, Keppler H, McCammon C, Bromiley FA, Jacobsen SD (2004) Hydrogen solubility and speciation in natural, gem-quality chromian diopside. *Am Mineral* 89: 941 - 949
59. Mierdel K, Keppler H (2004) The temperature dependence of water solubility in enstatite. *Contrib Mineral Petrol* 148: 305 - 311.
60. Audétat A, Keppler H (2005) Solubility of rutile in subduction zone fluids, as determined by experiments in the hydrothermal diamond anvil cell. *Earth Planet Sci Lett* 232: 393-402
61. Demouchy S, Deloule E, Frost DJ, Keppler H (2005) Pressure and temperature dependence of water solubility in Fe-free wadsleyite. *Am Mineral* 90: 1084-1091
62. Keppler H, Smyth JR (2005) Optical and near infrared spectra of ringwoodite to 21.5 GPa: Implications for radiative heat transport in the mantle. *Am Mineral* 90: 1209-1212
63. Keppler H, Audétat A (2005) Fluid-mineral interaction at high pressure. In: R. Miletich (Ed.) *Mineral Behaviour at Extreme Conditions*. European Mineralogical Union Lecture Notes in Mineralogy 7: 225-251

64. Keppler H, Frost DJ (2005) Introduction to minerals under extreme conditions. In: R. Miletich (Hrsg.) *Mineral Behaviour at Extreme Conditions*. European Mineralogical Union Lecture Notes in Mineralogy 7: 1-30
65. Glasmacher UA, Lang M, Keppler H, Langenhorst F, Neumann R, Schardt D, Trautmann C, Wagner GA (2006) Phase transitions in solids stimulated by simultaneous exposure to high pressure and relativistic heavy ions. *Phys Rev Lett* 96: 195701
66. Keppler, H, Bolfan-Casanova, N (2006) Thermodynamics of water solubility and partitioning. *Rev Mineral Geochem* 62: 193 - 230
67. Shcheka SS, Wiedenbeck M, Frost DJ, Keppler H (2006) Carbon solubility in mantle minerals. *Earth Planet Sci Lett* 245: 730-742
68. Mierdel K, Keppler H, Smyth JR, Langenhorst F (2007) Water solubility in aluminous orthopyroxene and the origin of Earth's asthenosphere. *Science* 315: 364-368
69. Keppler H, Kantor I, Dubrovinsky LS (2007) Optical absorption spectra of ferropericlasite to 84 GPa. *Am Mineral* 92: 433-436
70. Smyth JR, Mierdel K, Keppler H, Langenhorst F, Dubrovinsky L, Nestola F (2007) Crystal chemistry of hydration in aluminous orthopyroxene. *Am Mineral* 92: 973-976
71. Duc-Tin Q, Audetat A, Keppler, H (2007) Solubility of tin in (Cl, F)-bearing aqueous fluids at 700 °C, 140 MPa: A LA-ICP-MS study on synthetic fluid inclusions. *Geochim Cosmochim Acta* 71: 3323-3335
72. Baier J, Audetat A, Keppler H (2008) The origin of the negative niobium tantalum anomaly in subduction zone magmas. *Earth Planet Sci Lett* 267: 290-300
73. Keppler H, Dubrovinsky LS, Narygina O, Kantor I (2008) Optical absorption and radiative thermal conductivity of silicate perovskite to 125 gigapascals. *Science* 322: 1529-1532
74. Xiong X, Keppler H, Audetat A, Gudfinnsson G, Sun W, Song M, Xiao W, Li Y (2009) Experimental constraints on rutile saturation during partial melting of metabasalt at the

amphibolite to eclogite transition, with applications to TTG genesis. *Am Mineral* 94: 1175-1186

75. Schiavi F, Walte N, Keppler H (2009) First in situ observation of crystallization processes in a basaltic-andesitic melt with the moissanite cell. *Geology* 37: 963-966

76. Keppler H (2010) The distribution of sulfur between haplogranitic melts and aqueous fluids. *Geochim Cosmochim Acta* 74: 645-660

77. Gavrilenko P, Boffa Ballaran T, Keppler H (2010) The effect of Al and water on the compressibility of diopside. *Am Mineral* 95: 608-616

78. Schiavi F, Walte N, Konschak A, Keppler H (2010) A moissanite cell apparatus for optical in situ observation of crystallizing melts at high temperature. *Am Mineral* 95: 1069-1079

79. Weigel C, McCammon C, Keppler H (2010) High-temperature Mossbauer spectroscopy: A probe for the relaxation time of Fe species in silicate melts and glasses. *Am Mineral* 95: 1701-1707

80. Binder B, Keppler H (2011) The oxidation state of sulfur in magmatic fluids. *Earth Planet Sci Lett* 301: 190-198

81. Yang X, Keppler H (2011) In-situ infrared spectra of OH in olivine to 1100 °C. *Am Mineral* 96: 451-454

82. Bali E, Audetat A, Keppler H (2011) The mobility of U and Th in subduction zone fluids: An indicator of oxygen fugacity and fluid salinity. *Contrib Mineral Petrol* 161: 597-613

83. Xiong X, Keppler H, Audetat A, Ni H, Sun W, Li Y (2011) Partitioning of Nb and Ta between rutile and felsic melt and the fractionation of Nb/Ta during partial melting of hydrous metabasalt. *Geochim Cosmochim Acta* 75: 1673-1692

84. Yang X, Keppler H, McCammon C, Ni H, Xia Q, Fan Q (2011) Effect of water on the electrical conductivity of lower crustal clinopyroxene. *J Geophys Res* 116: Article Number B04208

85. Ni, H, Keppler H, Behrens H (2011) Electrical conductivity of hydrous basaltic melts: implications for partial melting in the upper mantle. *Contrib Mineral Petrol* 162: 637-650
86. Ni H, Keppler H, Manthilake MAGM, Katsura T (2011) Electrical conductivity of dry and hydrous $\text{NaAlSi}_3\text{O}_8$ glasses and liquids at high pressures. *Contrib Mineral Petrol* 162: 501-513
87. Yang X, Keppler H, McCammon C, Ni H (2012) Electrical conductivity of orthopyroxene and plagioclase in the lower crust. *Contrib Mineral Petrol* 163: 33-48
88. Ni H, Keppler H (2012) In-situ Raman spectroscopic study of sulfur speciation in oxidized magmatic-hydrothermal fluids. *Am Mineral* 97: 1348-1353
89. Bali E, Keppler H, Audetat A (2012) The mobility of W and Mo in subduction zone fluids and the Mo-W-Th-U systematics of island arc magmas. *Earth Planet Sci Lett* 351: 195-207
90. Shcheka SS, Keppler H (2012) The origin of the terrestrial noble-gas signature. *Nature* 490: 531-534
91. Bernini D, Wiedenbeck M, Dolejs D, Keppler H (2013) Partitioning of halogens between mantle minerals and aqueous fluids: Implications for the fluid flow regime in subduction zones. *Contrib Mineral Petrol* 165: 117-128
92. Bali E, Audetat A, Keppler H (2013) Water and hydrogen are immiscible in Earth's mantle. *Nature* 495: 220-222
93. Bernini D, Audétat A, Dolejs D, Keppler H (2013) Zircon solubility in aqueous fluids at high temperatures and pressures. *Geochim Cosmochim Acta* 119: 178-187
94. Ni H, Keppler H (2013) Carbon in silicate melts. *Rev Mineral Geochem* 75: 251-287
95. Li Y, Wiedenbeck, M, Shcheka S, Keppler H (2013) Nitrogen solubility in upper mantle minerals. *Earth Planet Sci Lett* 377-378: 311-323
96. Masotta M, Ni H, Keppler H (2014) In situ observations of bubble growth in basaltic, andesitic and rhyodacitic melts. *Contrib Mineral Petrol* 167: Art Nr 976

97. Keppler H (2014) Earth's deep water reservoir. *Nature* 507: 174-175
98. Li Y, Keppler H (2014) Nitrogen speciation in mantle and crustal fluids. *Geochim Cosmochim Acta* 129: 13-32
99. Yang X, Keppler H, Dubrovinsky L, Kurnosov A (2014) In-situ infrared spectra of hydroxyl in wadsleyite and ringwoodite at high pressure and high temperature. *Am Mineral* 99: 724-729
100. Schmauss D, Keppler H (2014) Adsorption of sulfur dioxide on volcanic ashes. *Am Mineral* 99: 1085-1094
101. Ni H, Keppler H, Walte N, Schiavi F, Chen Y, Masotta M, Li Z (2014) In situ observation of crystal growth in a basalt melt and the development of crystal size distribution in igneous rocks. *Contrib Mineral Petrol* 167: Art Nr 1003
102. Korschak, Alexander; Keppler, H (2014) The speciation of carbon dioxide in silicate melts. *Contrib Mineral Petrol* 167: Art Nr 998
103. Mookherjee, Mainak; Keppler, Hans; Manning, Craig E. (2014) Aluminum speciation in aqueous fluids at deep crustal pressure and temperature. *Geochim Cosmochim Acta* 133:128-141

Articles in books

- Keppler H (1999) Crystal field theory. In: *Encyclopedia of Geochemistry*. Kluwer Academic Publishers, Dordrecht: 118 - 120
- Keppler H (2013) Volatiles under high pressure. In: Karato SI (ed): *Physics and Chemistry of the Deep Earth*. Wiley-Blackwell: 3 - 37

Books

- Keppler H, Smyth JR (2006) Water in Nominally Anhydrous Minerals. *Rev Mineral Geochem* 62: 1- 478

Patents

Kepler H (1992) Verfahren zur Durchführung von Ionenaustauschreaktionen an Glimmern. Patent DE 37 28 003.C 02 of German Patent Office, 1 - 6

Kepler H, Walte N (2005) Hochtemperatur Moissanitsichtzelle. Patent 10 2005 056 977 of German Patent Office, 1-5