Equilibria in the system magnesium oxide-silicon dioxide-water: a thermodynamic analysis

Full Text

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Thermodn. anal. of exptl. detd. reactions among H2O and the 9 minerals, antigorite, anthophyllite, brucite, chrysotile, enstatite, forsterite, periclase, quartz, and talc, shows that the available calorimetrically detd. enthalpies and entropies are not compatible with the hydrothermal expts. Major discrepancies appear to exist for the enthalpies of formation of talc and enstatite and for the entropy of anthophyllite. The exptl. data, molar vols. and heat capacities are internally consistent, however, and permit only 1 topol. of phase diagram for Mg anthophyllite, that 1st proposed by H. J. Greenwood (1963). The best set of thermodn. parameters, internally consistent with these data, includes values for the enthalpy of formation from the elements (298 K, 1 bar) of antigorite and anthophyllite: -71,435 kJ and -12,073 kJ, resp.

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9 THERE ARE 9 CAPLUS RECORDS THAT CITE THIS RECORD (9 CITINGS)

A chemographic analysis of magnesian serpentinites using dual networks

Full Text

Author Name:	O'Hanley, David S.

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The method of dual networks is used to research the stability of lizardite [12161-84-1] and chrysotile [12001-29-5] within the simplest multisystem that describes serpentinization. The method focuses on obsd. assemblages as the base to construct potential solns. for the phase diagram. As many phases in the chemog. as necessary can be included to describe the observations. In this sense, the restriction of systems to n + 3 phases is artificial, although the new method takes advantage of the methodol. developed for such systems. Potential solns. for Mg serpentinites described by MgO-SiO2-H2O are constructed for systems of 5, 6, and 7 phases. Chemog. anal. is used to study the 5-phase system, brucite [1317-43-7], lizardite, chrysotile, antigorite [61076-98-0] and talc, in which lizardite and chrysotile are considered to be polymorphs. After eliminating thermodynamically impossible solns. at std. temp. and pressure, remaining potential solns. are used to construct solns. for larger systems that include forsterite and enstatite as addnl. phases. Using observations to construct the dual network automatically filters out many potential solns. The remaining potential soln., constructed for the 7-phase system, brucite, forsterite [15118-03-3], lizardite, chrysotile, antigorite, enstatite [14681-78-8] and talc, describes the serpentinization of Mg peridotites. The existence of the reaction lizardite = chrysotile needs to be demonstrated. In the system used, the stability of lizardite and chrysotile within Mg serpentinites depends on the location of the reaction lizardite = chrysotile; if the reaction lizardite = chrysotile is located at >8 kbars, then chrysotile is the stable phase in serpentinites; if the reaction is located at lower pressures, lizardite is the stable phase.

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1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)