Calorimetry of CaTiO3-CaSiO3 perovskites and high pressure dissociation boundary of CaMg2SiO6 diopside

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The enthalpies of perovskite(Pv.) solid solutions in the system CaTiO3-CaSiO3 have been measured at 805C by differential drop-solution calorimetry method in Pb2B2O5 solvent,using a twin Calvet-type microcalorimeter. The enthalpy of CaSiO3 (Pv.) was estimated to be about 11.3 kJ/mol obtained by linear extrapolation of the measured enthalpy data of the perovskite solid solutions .

Using the estimated enthalpy of CaSiO3(Pv.), the transition enthalpy of CaSiO3 wollastonite to perovskite at 298K was calculated as 108.5kJ/mol .

Using this thermochemical data, the phase boundary of CaMgSi2O6 diopside to CaSiO3 perovskite + 0.5 SiO2 stishovite + 0.5 Mg2SiO4 spinel was calculated : P(GPa)=2.45X10^-3(K)+14.4