



FIG. 1. Crystalline phases in the system $\text{FeO-Fe}_2\text{O}_3\text{-Al}_2\text{O}_3\text{-SiO}_2\text{-H}_2\text{O}$ projected onto the $\text{FeO-Al}_2\text{O}_3\text{-SiO}_2$ plane.

(1965) the use of highly reactive oxide mixes resulted in the crystallization of relatively less reactive crystalline phases. At water pressure below 10 kbar, and within the apparent stability field of chloritoid, a 7 Å iron chlorite (chamosite) bearing assemblage was persistent and attempts to synthesize chloritoid failed. Both workers considered the chamosite assemblage to be metastable, but were unable to produce any conclusive data on the relative stabilities of chloritoid and the chamosite assemblage. In the present study it has been established that the chamosite assemblage is, in fact, unstable with respect to chloritoid at pressures from 1 to 10 kbar.

Standard hydrothermal techniques and equipment were used in the current study. All the experiments were carried out in cold seal bombs, with the oxygen fugacity controlled by the Ni-NiO buffer. The charge arrangement was similar to that of Eugster and Wones (1962) and the starting materials were either oxide mixtures or synthetic crystalline phases. Argon was used as the pressure medium at 5.5 kbar and above, and water at lower pressures.

Data from the present study is shown in Table 1. Identification of chloritoid was based primarily on X-ray diffraction patterns of the