Phase relation of the system MnO-SiO2-H2O under hydrothermal conditions

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Hydrothermal synthesis experiments were carried out on the system MnO-SiO2-H2O with starting materials of a natural caryopilite and synthetic SiO2-MnO mixture gel. Caryopilite, Mn analogue of serpentine, decomposed to tephroite and Mn-clinopyroxene between 450 degrees C and 550 degrees C, and to tephroite and pyroxmangite between 550 degrees C and 700 degrees C. Pyroxmangite occur in the run products between 400 degrees C and 700 degrees C from synthetic gel. However, Mn-clinopyroxene did not occur in run products from synthetic gel. Pyroxmangite was stable at 500 degrees C and Mn-clinopyroxene changed into pyroxmangite at 575 degrees C. Mn-clinopyroxene may be a metastable product owing to SiO4 tetrahedra sheet structure in caryopilite.