Evolution of the borosilicates of the high-grade rocks and their relationships with anatexis in the Larsemann Hills, East Antarctica

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A suite of khondalite rocks of low-pressure granulite facies metamorphism are underlain by the Larsemann Hills,East Antarctica. The rocks are well developed in anatexis and an unique borosilicate mineral assemblage has been discovered in some gneisses.This paper concerns the crystallization of the borosilicate minerals and the relationship with anatexis.It is concluded that there is a complicated crystallization order of boron-bearing minerals in the high-grade rocks of the Larsemann Hills. As to kornerupine and grandidierite,the former comes first,and the latter second,but not *vise versa*. Two or more borosilicate minerals have never been found to form simutaneously.According to the time sequence and feature of the products,two kinds of anataxis have been discerned.The first anatexis mainly formed the garnet-bearing granitic veins,while the second anatexis is responsible for the occurrence of orthopyroxene,cordierite and syenogranite and potassium feldspar-rich veins.The borosilicate mineral related to the first anatexis is tourmaline and all the kinds of borosilicates of the area are present in the second anatexis,and kornerupine and grandidierite corresponds to the early and late stage of the partial melting,respectively.Between the two times of anatexis are the periods of cooling and uplifting successively,that is to say,the PT path is not a simple clockwise loop.There are two possibilities of boron enrichment mechanism: original feature and remobilization-enrichment.In both cases occurred the activitation of the volatiles. Given a certain concentration, the boron component not only affects the development and feature of anatexis,but also is related inimately with the types of melting products.