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Geological Features of Albite–Bearing Diopside Rock Newly Discovered in Kangso Region, Northwestern Korean Peninsula

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Recently albite–bearing diopside rock (ADR) which contains a lot of albite has been discovered in the Kangso region, Northwestern Korean Peninsula and there was no precedent study on its geological features. In order to elucidate geological features of the ADR in this region, its distribution characteristic, mineral composition, and formation process are discussed in this paper.

Diopside shows its useful characters such as a low melting point (1 390°C), a low thermal expansivity, a low viscosity of melt and eutectic composition with kaolinite or feldspar. The quick firing at low temperature can be applied in the firing of ceramics by such characters of diopside to economize a great deal of energy. The diopside resources that are now applied to industry contain over 60 % of diopside as a main mineral constituent and contain tremolite, plagioclase, phlogopite, calcite and quartz as a paragenetic mineral. The genetic types of diopside rocks known up to now are contact metasomatic type, regional metamorphic type, thermal metamorphic type and self–metasomatic type of ultrabasic rock. As a result of intensification of the study work on the genetic types of diopside rocks, new kinds of diopside rocks formed by alteration with deep hydrothermal fluid have been discovered. Recently albite–bearing diopside rock (ADR) related with Lower Proterozoic metacarbonate rock has been firstly discovered in the Kangso region, Northwestern part of the Korean Peninsula.

In the Kangso area, diopside rocks develop in the metacarbonate rock strata of the apatite–bearing formation, the third formation of the Lower Proterozoic metamorphic group (Jungsan Group). Its scale is 300–500m in extended length of the strike direction, up to 100m in extended length of the dip direction and 30~40m in thickness. In this region, diopside rock develops in a connection with albite veins in the metacarbonate rock strata. The diopside rock in the study area is an albite–diopside rock that consists of diopside (60~90%), albite (6~40%) and a small quantity of accessory minerals such as tremolite, calcite and epidote. Third, diopside in the ADR in this region is not normal one, but salite in the view of mineralogy. As a new type of diopside rock by mineral composition, ADR is expected that its formation process is distinctive. In a view point of forming process, genesis of the ADR in the study area belongs to a polygenic type between regional metamorphic genesis and hydrothermal alternated genesis unlike diopside rocks in other regions. The ADR is formed through two formation stages. In the first formation stage, siliceous dolomite in the metacarbonate strata of the Jungsan Group is metamorphosed in a high–grade amphibolite facies to form dolomitic marble that contains diopside and plagioclase in a great quantity. After the time, the dolomitic marble is subjected to an action of Na–rich granitic fluid in the second formation stage. In this time, anorthite is alternated with albite by an alkali metasomatism and then the ADR is formed.

Such research consequences imply that the diopside rock in the study area is a new kind of diopside resources. This research is of certain significance on prospecting, exploitation and application of the diopside resource as a material resource of ceramics.