Distribution and Geology of Carbonatite Occurrences in Northern Region of Korean Peninsula

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New carbonatites have been discovered from the four corners of the earth and their numbers are increasing. Number of the known carbonatites is 527 and carbonatites are occurred in almost continents. In China neighboring with Korean Peninsula, there are 27 carbonate occurrences. An existence of carbonatites in the northern region of the Korean peninsula has not been studied yet. As a result of enlarged exploration and development of the phosphorus-bearing carbonate rocks, new geological data concerning with it began to appear and it gave us possibility to study the origin of the carbonate rocks in view of new researches. Also, the world-wide reserve and output of the REE resource of carbonatite type takes considerable part of reserve and output, but in the north region of the Korean peninsula these kinds of REE ore deposits have not discovered yet.

Some igneous characteristics have been suggested in phosphorus-bearing carbonate rocks of Pungnyon, Yongyu, Sangryong, and Puhung districts that were before estimated as sedimentary metamorphic rocks. But there were not detailed and clear data that could ensure them as carbonatites, igneous carbonate rocks. The purpose of this paper is to clarify distribution characteristics of carbonatite occurrences in the north region of Korean peninsula, and to prove that this region has the potential of carbonatite type resources by studying their characteristics from the geological point of view.

We ensured that the phosphorus-bearing carbonate rocks existing in Ssangryong, Pungnyon, Yongyu and Puhung districts are carbonatites originated from mantle. There are phoscorites, too. The carbonatite bodies are distributed in Emergences of subsidence and Upheaval in basin and massif, northern region of the Korean Peninsula. According to analysis of satellite photo, carbonatite occurrences are distributed in the crossing parts and around of ring and lineaments in northern region of Korean peninsula. Here, phoscorites are associated not only with carbonatite bodies of pipe-like structure but also with carbonatite bodies of linear structure. And carbonatite bodies are mainly developed as independent dykes that cut country rocks. Only, in Pungnyon area carbonatites are associated with igneous alkali-silicate rocks. The other carbonatite occurrences except Pungnyon occurrence exist independently without connection with associated igneous silicate rocks. Carbonatites and related nepheline syenites in Pungnyon occurrence are of mantle origin and reflect the impact of a mantle plume on the northern lithosphere of Korean Peninsula. The research results show that carbonatitic magmatism has been occurred in north region of Korean peninsula. And this region has big development potentiality for REE resource of carbonatite type. Carbonatite occurrences of northern region of the Korean peninsula are excellent green field exploration targets for a range of commodities, including REE, speciality metals, and PGEs.