

ON THE PROBLEM OF VERTICAL ZONING OF KIMBERLITE BODIES. (ON THE EXAMPLE OF LESOTHO).

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The problem of diamond content and composition change with the depth in kimberlite bodies remains extremely the matter of current interest up to the present. For its decision data of prospecting well and exploring openings and also data of directly operation work are used, but interpretation of results obtained quite often are in the contradictory nature. Kimberlite bodies - pipes, dykes and swells, related to dykes of Lesotho, which, owing to peculiarity of geologic development of the region, were turned out to be stripped on different hypsometric levels with drops of heights to 1,5-1,6km in comparatively small distances (130-150km) are unique in this respect. This creates favourable possibility to trace vertical kimberlite changeability within indicated interval without boring of expensive wells.

The authors undertook an attempt to trace changes in relation of pipes, dykes and swells, their dimensions and morphology, composition and peculiarities of diamondiferousness of 4 groups of Lesotho kimberlite bodies, located on different altitudes (about 3,2; 2,6; 1,8; 1,5km) above sea level. The carried out investigations established predominance of dyke facies (with a number of which swells are connected) over pipe facies in all areas. Appreciable differences in size and morphology of dykes have not been registered; at the same time, considerable reduction of pipe formation areas in the direction from mountainous sections to relatively low sections is observed. The bonding mass of dyke swells and some pipes contains increased amounts of perovskite, ilmenite of second generation, and, in a number of cases, phlogopite and monticellite, that is reflected on increased content of TiO_2 , K_2O and P_2O_5 in these rocks. Xenoliths of plutonic rocks are characteristic of decreased PT-conditions of formation. Xenoliths of pyroxene-spinel facies prevail among them, and varieties of diamond facies do not practically occur. In spite of appreciable variations of composition in each group and even inside one of a specific body, the increased content of microilmenite, moderately chromous pyrope and

clinopyroxene is registered for majority of dykes and pipes. From secondary minerals, the development of saponite (sometimes to complete substitution of rocks of some dykes by corresponding argillaceous formations) is extremely characteristic one. The study of all garnet selections from kimberlite concentrates of all 4 groups shows either presence of literally single grains of this mineral of diamondiferous facies (Litseng la Terae, Kao, etc.), or their complete absence (majority of non-diamondiferous bodies), that confirms reliability of N.B. Sobolev's mineralogical criteria of kimberlite diamondiferousness.

Thus, the carried out investigations of Lesotho kimberlites have not revealed just a little differences in vertical, almost 1,5-km-sequence, except dimensions of pipe areas. These data are quite in conformity with results of study of a number of Yakutiya kimberlite bodies, traced by prospecting wells up to the depth of 1,0 - 1,2 km.