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Estimation of Emanation Properties of Kimberlites and Host Rocks of Lomonosov Diamond Deposit in Russia

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Abstract : The study is devoted to experimental work on the assessment of emanation properties of kimberlites and host rocks of the Lomonosov diamond deposit of the Arkhangelsk diamondiferous province. The aim of the study is estimation the factors influencing on formation of the radon field over kimberlite pipes. For various types of rocks composing the kimberlite pipe and near-pipe space, the following parameters were measured: porosity, density, radium-226 activity, activity of free radon and emanation coefficient. The research results showed that the largest amount of free radon is produced by rocks of near-pipe space, which are the Vendian host deposits and are characterized by high values of the emanation coefficient, radium activity and porosity. The lowest values of these parameters are characteristic of vent-facies kimberlites, which limit the formation of activity of free radon in body of the pipe. The results of experimental work confirm the prospects of using emanation methods for prospecting of kimberlite pipes.

Keywords : emanation coefficient, kimberlites, porosity, radon volumetric activity
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