

Material composition of coastal marine placer deposits of the Arabian sea coast (Kollam, Kerala, India)

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Abstract

© SGEM2016. The article is devoted to the comprehensive study of black sands – coastal-marine placer deposits on the coast of the Arabian Sea (Kollam, Kerala, India). In the course of works we studied in detail the mineral composition of sands, consisting of ore minerals (ilmenite, rutile), fragments of quartz, feldspar, garnet, zircon and monazite. Enhanced background of radioactive chemical elements is associated with black sands. The ratio of monazite and ilmenite in sands is variable. Based on the results of research we established two morphological types of zircons: with an admixture of Hf (up to 1.3%) and without Hf. Ore fraction is presented by ilmenite, containing Ti up to 37%, Fe up to 25%, useful impurities – V up to 0.5%. Studies suggest that black sands of the coastal-marine zone in Kerala have heterogeneous composition: ore and nonmetallic components are allocated. Ore minerals prevail in sands: ilmenite, to a lesser extent – rutile. We also allocated and studied mineralogical and geochemical features of other minerals – quartz, zircon, monazite, sillimanite, garnet. The investigated samples of sands contain an increased amount of radioactive chemical elements, owing to a high content of monazite mineral (contains thorium-232). The high concentration of minerals as part of the sands is due to the influence of wave action of the sea in littoral areas, which contributes to the removal of light components and the accumulation of heavy fractions with a high amount of zircon and monazite.

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Keywords

Black sands, Ilmenite, Monazite, Thorium, Zircon