

Phase transformations of minerals during calcination of Bulgarian kaolin and obtaining products with a commercial application

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Phase transformations in the calcination of Kaolin EAD's Bulgarian enriched kaolin, mined from Vetovo area, Ruse region, are examined. For this purpose, kaolin is heated to 1350°C and at certain points of the temperature interval (850°C, 1100°C and 1350°C) characteristics of the products obtained – chemical content (RFA), mineralogical composition (XRD), specific density, water absorption, color etc. are determined. The results show that at 850°C the kaolinitic lattice is completely decomposed which results in the formation of a maximum amorphous phase amount without thermal changes in the structure of the quartz. At 1100°C mullite formation starts and at 1350°C mullite, cristobalite, quartz and amorphous phase are registered at the same time. Water absorption, a criterion for the degree of kaolin sintering, logically decreases with increase in temperature, while the specific density slightly rises, and then lowers because of cristobalite phase formation.

The products obtained at these temperatures – metakaolin, calcined kaolin and chamotte, respectively, have specific properties and find application in a number of areas (ceramics, plastics, rubber, paints, coatings, concrete etc).

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