PROCESSES OF BERYLLIUM HYDROXIDE AEROSOL FORMATION AND ASSESSMENT OF ECOLOGICAL RISKS ARISING AT ITS EMISSIONS IN THE ENVIRONMENT

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Abstract. The processes leading to the formation of toxic beryllium-containing aerosol particles at the stages of production of beryllium hydroxide by a new innovative technology of ore processing at the Ermakovskoye deposit are considered. In order to create a conceptual structure of experimental samples of the control units for emissions and discharges of pollutants in the production of beryllium hydroxide, the processes of aerosol formation at various technological stages of beryllium production have been studied. A diffusion model for the evaporation of a drop during the leaching and hydrolysis of beryllium concentrates is proposed, which, depending on the environmental conditions, determines the rate of evaporation, temperature, size and lifetime of the drop. The results of model calculations (within the diffusion model) of the dispersed composition of beryllium containing aerosol particles are presented. The most dangerous stages of emissions and discharges of beryllium-containing aerosols in the production of beryllium hydroxide by the new technology have been identified, they turned out to be leaching and hydrolysis. The formation of aerosol particles of the most dangerous size for human health is possible at these stages. An assessment of the environmental risks arising from the release of aerosol particles into the atmosphere is performed.

Keywords: aerosol particles, dispersed composition, mechanism of aerosol formation, beryllium hydroxide, drop evaporation, diffusion model, ecological risks.