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Elaboration of new types, environmentally safe fire-extinguishing powders and establish the conditions of extinguish optimum and effective use of such powders

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The aim of the presented investigation is the development of technology for production of novel, halogen-free, environmentally safe, highly efficient fire-extinguishing powders based on local mineral raw materials which does not require modification with expensive, halogen-inclusive, hydrofobizing additives, providing low-cost production of fire-extinguishing powders in comparison with imported analogues. The optimal dispersity was selected in such way, that caking capacity is minimal and a homogeneous action of combustion products on the flame as well as a heterogeneous inhibition of combustion process must take place. The evaluation of powder efficiency is carried out with consideration of the both effects. Experimental data confirm that the developed fire-extinguishing powders are characterized with high performance characteristics, as well as high fire-extinguishing capacity. At the same time it should be noted that the efficiency of the obtained powders is practically the same as of standard imported powders, but do not contain any halogens, is environmentally safe and 1.5-2 times cheaper than the imported analogues. For obtained powders, the conditions of extinguish optimum and effective use of powder are stated. Optimum extinguishing condition means the selection of optimum intensity of powder supply into seat of fire when minimum consumption of powder provides fire extinguishing in minimum time. Thus, in order to determine optimum conditions of extinguishing it is necessary to study the dependence of powder specific consumption and extinguishing time to supply intensity. For our powders optimum condition of extinguish is the powder supply intensity 1-0.6-1.0 kg/m²sec to fire center when powder specific consumption does not exceed $G=0.8-1.2$ kg/m². Therefore, we can surmise that the use of fire-extinguishing powders of our preparation is possible at extinguishing of all types of fires over ground, as well as, underground constructions and does not need additional antiseptic measures.

Biography

Lali Gurchumelia is a Chemist, Doctor of Technical Sciences. She has worked with TSU Rafael Agladze Institute of Inorganic Chemistry and Electrochemistry (Georgia). Her research interests are in chemical science, chemical engineering, ecological engineering and ecological biotechnology. She has 55 publications, including in the infactatorial journal-12. Currently she is the Manager of the grant# 216770- New type fire-extinguishing powders and foam-suspensions based on local mineral raw materials. She has also participated in many international conferences and congresses such as Nürnberg, Germany; Toledo, Spain; New Forest, UK; Montreal, Canada; Istanbul, Turkey; Elenite Holiday Village, Bulgaria; Rome, Italy; Paris, France; Yerevan-Vanadzor; Tbilisi, Georgia and Ureki, Georgia.

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