Mathematical Model of an Electric Hater Based on a Nano-modified Elastomer with the Effect of Temperature Self-regulation

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Abstract:
A method for mathematical modeling of heat release in functional materials based on fluoroplastics modified with carbon nanotubes has been developed. To efficiently simulate the processes of heat release in a polymer matrix, a partial differential equation (Poisson's equation) is used, which, with physical interpretation, corresponds to the relationship of the potential field with heat release. The features of the polymer matrix and carbon nanotubes are taken into account. An equation for the percolation of electrical conductivity in a polymer is presented upon the introduction of various concentrations of carbon nanotubes. To assess the dynamics of heat release, a system of differential equations was used, which takes into account the peculiarities of heat transfer. The solution of the system of differential equations is carried out on the basis of the numerical Runge-Kutta method.

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I. Introduction

An increase in the efficiency of various tech ents is associated with the development of new types of materials.

Authors

Figures

References

Keywords

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