

## عنوان مقاله:

Prediction of thermal properties of polymer nanocomposites heat insulators in high temperature using analytical perturbation theory

## محل انتشار:

اولین کنگره بین المللی شیمی و نانو شیمی از پژوهش تا فناوری (سال: 1397)

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## خلاصه مقاله:

The transient heat transfer in an insulator undergoing high temperature has a non-linear feature, which involves time-dependent moving boundaries. The inherent difficulties in the analysis of such problems are the non-linear nature of the interface boundaries, the unknown locations of the moving boundaries and temperature-dependent thermo-physical properties of insulators which necessitate the use of special solution techniques. In this work, thermo-physical properties of the polymeric insulators have been modeled and compared with the experimental data. Also, the back temperature of composite and nanocomposite insulators in high temperature were predicted using a simple perturbation technique, which presents an approximate analytical solution. The results have displayed a good agreement between the experimental data and analytical solution technique. It was indicated that the thermal response of polymer nanocomposite insulator improves in comparison with composite counterpart, due to its better thermo-physical properties. It is observed that the thermal diffusivity of ablative polymer nanocomposite is lower than polymer composites at high temperature, and shows significantly difference in pyrolysis and char zones.

## کلمات کلیدی:

polymer nanocomposite, high temperature, insulator, perturbation

## لینک ثابت مقاله در پایگاه سیویلیکا:

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