Scopus

Documents

Purusothaman, A., Murugesan, K., Chamkha, A.J.

3D modeling of natural convective heat transfer from a varying rectangular heat generating source
(2019) *Journal of Thermal Analysis and Calorimetry*, .

Abstract
The natural-convection thermal performance of a dielectric liquid in a cubical module triggered by a varying rectangular heat generation source is numerically examined. The rectangular generating source is connected to the center of one vertical wall of the cubical module, which is constructed either vertically or horizontally. Two vertical walls neighboring the source-mounted wall are kept cold, and the remaining walls are insulated from the environment. The isotherms and the velocity contours are computed for a wide range of the Rayleigh number as well as the generating-source aspect ratio and the thermal conductivity ratio, demonstrating the variations of the thermal and stream structures inside the module. It is established that the thermal performance is more significant and is an increasing function of the heat generating-source aspect ratio and the Rayleigh number for the two altered alignments of the generating source. According to the practical demands of the thermal management of electronic devices, the heat transfer rate can be magnified or diminished by choosing the proper parameters such as thermal conductivity ratio, Rayleigh number, the aspect ratio and orientation of the generating source. © 2019, Akadémiai Kiadó, Budapest, Hungary.

2-s2.0-85065032041
Document Type: Article
Publication Stage: Article in Press
Source: Scopus