عنوان مقاله:

Numerical Investigation on Thermal Performance of a Composite Porous Radiant Burner under the Influence of a ۲-D Radiation Field

محل انتشار:

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خلاصه مقاله:

This work presents a numerical study to investigate the heat transfer characteristics of a ۲-D rectangular composite porous radiant burner (CPRB). In the construction of porous burner, the porous layer is considered to be of composite type consisting of upstream and downstream layers with equal thickness but with different physical and radiative properties. In the present work, a two dimensional rectangular model is used to solve the governing equations for porous medium and gas flow. In order to analyze the thermal characteristics of the CPRB, the coupled energy equations for the gas and porous medium are solved numerically and the discrete ordinates method is used to obtain the distribution of radiative heat flux in the porous media. Finally, the effects of various factors on the performance of CPRB are determined. Computational results show that high porosity and low scattering coefficient for downstream porous layer are desirable for maximizing the CPRB efficiency in comparison to a homogeneous one. Present results prove to be compatible with results obtained from previous studies.

کلمات کلیدی: