

عنوان مقاله:

Effects of Viscosity on a Thick Circular Plate in Thermoelastic Diffusion Medium

محل انتشار:

فصلنامه مکانیک جامد، دوره 11، شماره 3 (سال: 1398)

تعداد صفحات اصل مقاله: 12

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خلاصه مقاله:

The problem treated here is to determine the viscosity effect on stresses, temperature change and chemical potential in a circular plate. The mathematical formulation is applied to two theories of thermoelastic diffusion developed by Sherief et al. [27] with one relaxation time and Kumar and Kansal [9] with two relaxation times. Laplace and Hankel transform techniques are used to obtain the expression for the displacement components, stresses, temperature change and chemical potential. The resulting quantities are computed numerically and depicted graphically by using numerical inversion technique for a particular model. Effect of viscosity is shown in the normal stress, tangential stress, temperature change and chemical potential. Some particular cases of interest are also deduced. Viscoelastic materials play an important role in many branches of engineering, technology and, in recent years, biomechanics. Viscoelastic materials, such as amorphous polymers, semicrystalline polymers, and biopolymers, can be modelled in order to determine their stress or strain interactions as well as their temporal dependencies.

کلمات کلیدی:

Viscothermoelastic, Thick circular plate, Laplace and Hankel transforms, Viscosity

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