

Stagnation point flow and mass transfer with chemical reaction past a stretching/shrinking cylinder

ABSTRACT

This paper is about the stagnation point flow and mass transfer with chemical reaction past a stretching/shrinking cylinder. The governing partial differential equations in cylindrical form are transformed into ordinary differential equations by a similarity transformation. The transformed equations are solved numerically using a shooting method. Results for the skin friction coefficient, Schmidt number, velocity profiles as well as concentration profiles are presented for different values of the governing parameters. Effects of the curvature parameter, stretching/shrinking parameter and Schmidt number on the flow and mass transfer characteristics are examined. The study indicates that dual solutions exist for the shrinking cylinder but for the stretching cylinder, the solution is unique. It is observed that the surface shear stress and the mass transfer rate at the surface increase as the curvature parameter increases.

Keyword: Stagnation point flow; Mass transfer; Chemical reaction past; Stretching cylinder; Shrinking cylinder