

AN ABSTRACT OF A THESIS

AN ANALYSIS OF THE EQUATIONS GOVERNING MOLECULAR
DIFFUSION

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An analysis of the equations that govern molecular diffusion with trapping sites has been studied using the finite element method of analysis. In this study the diffusing species and two trapping sites were included in the theoretical development. There were three coupled time dependent partial differential equations formulated in area coordinates. The finite element analysis was accomplished using a user-written computer code. The computer code had the capability to obtain solutions in Cartesian coordinates and axisymmetric cylindrical coordinates. The finite element analysis was verified by comparing with an analytical solution in the literature. Material constants for the diffusing species and trapping sites were varied in a somewhat random manner in the solution space. Computed results were presented in the form of contour and line plots.