A model has been formulated for the pyrolysis of wood.

This model includes heat and mass transfer. Heat transfer in the material is assumed to take place by thermal conduction and convection. Mass transfer of volatile pyrolysis products and water vapour occurs under the influlence of gradients in to tal pressure.

Pyrolysis is assumed to conform to an Arrheniusfunction, and vaporization occurs at a rate which is governed by the assumption that complete saturation in the pore systemis attained so long as there is water left at the point being studied.

The boundary conditions are governed by a gas temperature time curve or the energy flow rate. The energy balance at the boundary also includes oxidation of the charcoal layer and the effectof the outward gas flow on the thermal surface resistance.

Solution of the problem is studied by solving two non linear partial differential equations:

- one which yields the temperature distribution and

- one which yields the pressure distribution.

The problem has been formulated using the finite element method. The numerical solutions have been compared with experiments. There is good agreement between the experimental and the calculated results.

The importance of taking the initial moisture content into accounts evident from both the experiments and the calculations. Owingt to the pressure gradients which arise, there is a gradual and steeprise in moisture content. In those parts of the material where the temperature is above 100° C, vaporization occurs. The pressure gradients give rise to a mass flow directed towards the cooler parts of the material where the water vapour condenses.