Numerical study on the Pyrolysis modeling of tobacco particles using MATLAB

윤창현, 이성철*
한양대학교
(scyi@hanyang.ac.kr*)

Many substances are produced by pyrolysis in a naturally smoldering cigarette. In this study fourteen substances are considered that are dealt with in many cigarette studies due to those harmfulness for health. This study mainly focuses on : (1) pyrolysis of tobacco obeying Arrhenius kinetics, (2) evaporation of water from tobacco following a mass-transfer and rate-determined process, (3) weight loss of tobacco due to pyrolysis and evaporation, (4) internal heat transfer characterized by effective thermal conductivity, (5) heat loss attributable to free convection and radiation from the outer surface of the cigarette and endothermicity of the evaporation process, and (6) smoldering speed. This study mainly aims at suggesting ideal cigarette models through comparison and analysis of six factors mentioned above. Numerical study was implemented with commercially available ODE solver, MATLAB(ver. 6.0), using fundamental experimental data.