Droplet drying

Anditya Wiratmoko, author

Abstrak

The spontaneous combustion of coal stockpiles is a serious economic and safety problem. Unfortunately it is not easy to understand these phenomena. This is due to the mechanism of spontaneous combustion is affected by many internal and external factors including particle size. The low-temperatur oxidation reaction in the nature or stockpiles of coal piles is considered slow due to limited heat exchange between coal and direct surroundings. Thus, an adiabatic oxidation testing method used for determining the spontaneous combustion character propensity of a sub-bituminous coal. This work particulary focuses on studying the effect of particle size on the self-heating rate (R70) as well as the activation energy (Ea) and time to ignition (tad). The test showed that increase of the particle size decreased self-heating rate, increased ectivation energy and delayed time to ignition.

One of certain way to process the preserving of food and beverage or to ease the packaging process is drying process. To acieve the efficiency and effectiveness, it needs to find out the characterisitic of water content. This is the reason of research about the flow rate of the evaporation. It depends on the humidity, surrounding temperature, and the velocity of air. The instrument device uses injection contained aquades. Air flows through the droplet with the variation of velocity and temperature. It shows the relationship of Reynolds (Re), Prandtl (Pr), Schmidt (Sc), Nusselt (Nu), and Sherwood (Sh) numbers. Heat and mass transfer occur in this process. Ranz-Marshall analogy used to calculate the equation. Data of the experiments show the tendency of being above the Ranz-Marshall analogy.