

ABSTRACT

Carmen Gorksa

The aim of this work is to understand better the behaviour and characteristics of a phenomena called “smouldering combustion”. This is a specific form of burning in condensed-phase fuels, it is flameless and with lower temperatures and burning rates compared to flaming combustion.

Even if the nature of smouldering looks weak it actually creates a serious fire hazard. On one hand, the products of the combustion are very rich in toxic gases, this leads to deaths in residential fires. On the other hand, smouldering can start with very small heat sources and later evolve into flaming that can cause huge wildfires areas and other disasters. Sadly smouldering is often devaluated in the fire safety communities.

This work presents the information extracted from a matrix of peat mixed with sand that is taken into smouldering. This matrix is subjected to different conditions, like diverse air flows and oxygen concentrations. These variables affect the combustion by increasing or decreasing parameters like temperatures, velocity of the front propagation, reaction products, etc. These ranges of data may help to fight smouldering by designing special detectors, predicting the behaviour and understanding the process.