

## LETTER TO THE EDITOR

Recently there has been a discussion between Prof. Drysdale and Prof. Jones in the pages of this Journal concerning the proper use of the term “spontaneous ignition”. I am in the final stages of preparing a very large Ignition Handbook and so I would like to share with the readers the stance on nomenclature that I have adopted for the Handbook.

“Spontaneous ignition” has been widely used to refer to two different phenomena: (1) The ignition of a substance due to external heating, with the combustion being manifested in the gas phase or, occasionally, as a surface glowing combustion. (2) The manifestation of overt signs of combustion due to internal self-heating of a substance that does not receive external heating, but rather is cooled at its boundaries by natural convection. In this case, the exothermic reactions begin in the middle of the substance, if it is symmetrically disposed. In granular or porous solids, the combustion process in such cases begins as thermal runaway at the center, which in turn initiates propagation of a smolder front. Flaming or glowing become visible after some time, when the smolder front reaches an external surface.

Both the theoretical treatment and the practical, preventive measures needed for the two cases are

indeed different. Thus, nomenclature should be used which does not lead to confusion. In the forthcoming Ignition Handbook, I take the position that “spontaneous ignition” should not be used as a term at all. Case #1 is best referred to as “autoignition”. For Case #2, it is necessary to refer to its four stages: (a) self-heating, (b) thermal runaway, (c) sustained internal smoldering, and finally (d) spontaneous combustion (as visible externally). The term “spontaneous combustion” should be used for a process that goes through all these four stages. On some occasions, the process stops without going to the final stage of spontaneous combustion. Thus, if a pile of self-heating-prone material is cut open and it is found that the center is charred out, the pile should be referred to as having sustained thermal runaway (but not spontaneous combustion).

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