



Engineering Sciences Section – 2003

C29 The Role of Thermodynamics in Forensic Fire Investigation—A Review

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The goals of this presentation are to a review the role of thermodynamics in forensic fire investigation.

The phenomenon of fire is a complex process. The role of the forensic scientist is critical in investigating and understanding the ignition and propagation of fire at the scene. It involves an examination of the physical and chemical evidences left a fire scene. One of the important aspects of the fire investigation is to identify the origin of the fire and to determine its causes despite certain drawbacks such as destruction and disruption during the extinguishing of fire at the scene. In such an environment, the role of thermodynamics in fire investigation, fire ignition and propagation plays a vital role to help the investigator to examine scientifically. This paper exclusively enlightens and discusses the thermodynamic classification of ignition sources, phenomena of smoldering and flaming combustion whereby emphasizing the most significant sources and analyzes them thermodynamically, consequently highlighting the role of thermodynamics and that of the fundamental physics for a scientific conclusion in fire investigation. Even though it is a fact that the fires under investigation were not performed under the laboratory conditions, the thermodynamic equations and their solutions will certainly help to identify and give an affirmative report of the indication of the magnitude of the fire process in question scientifically.

Thermodynamics, Physical Constants, Fire Investigation