



**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
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*PRESENTATION ON*

# *THERMAL DECOMPOSITION*

**CUFS 2416 EXPLOSIVE AND POST BLAST INVESTIGATION**

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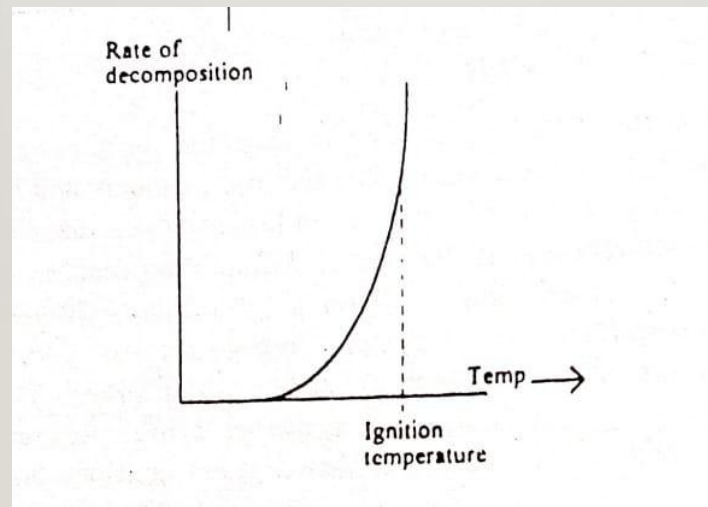
B.SC. FORENSIC SCIENCE (SEM 6)  
SCHOOL OF FORENSIC SCIENCES  
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# THERMAL DECOMPOSITION

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- All explosive substance undergo thermal decomposition at temperature far below those at which explosion occur.
- Strong exothermic reactions takes place which generate a lot of heat, some of heat is lost to the surroundings, but the remainder will raise the temperature of explosive even further.
- When the rate of heat generated is greater than the rate of heat lost, spontaneous decomposition will occur, i.e. ignition.

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- Decomposition of explosive substances generally follows the curve , where the rate rises very slowly at temperatures below 100°C and then steepens as the temperature approaches the ignition temperature of the explosive.



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- Explosives which have high ignition temperatures, such as TATB, HMX, HNS and TNT, also have a high stability to heat, whereas those with low ignition temperatures have a low stability to heat.
  - The chemical energy H generated by the decomposition of the explosive can be calculated from the heat lost to the surroundings F and the accumulation of heat in the explosive Q.

$$F+Q=H$$

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- The amount of chemical energy  $H$  generated by the decomposition of an explosive will give information on the sensitivity of the explosive, since the mechanism for the initiation of explosives is thermal. Concomitantly, a high value for  $H$  will result in a more sensitive explosive.

**THANK YOU.**

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