

# Fire & Explosives B

Chapter 12 and 13

# Types of explosives:

- The energy stored in an explosive material may be chemical energy, such as nitroglycerine
- Pressurized compressed gas, such as a gas cylinder or aerosol can.
- Nuclear, such as isotopes of uranium-235 and plutonium-239

# Explosive Evidence

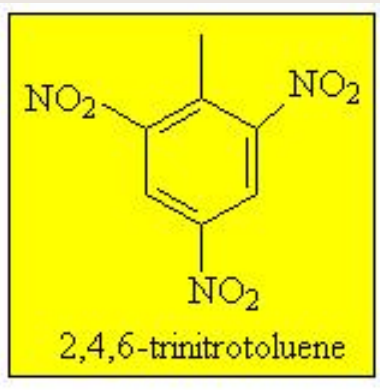
- An explosive is anything that, once ignited, burns extremely rapidly and produces a large amount of hot gas in the process. The hot gas expands very rapidly and applies pressure.
- **Explosives are classified by how fast they detonate.**
- Explosives are classified as two types:
  1. **Low** – reaction produces light, heat, and pressure wave.
    - Most homemade explosives
    - Made from ingredients readily available and easy to get.

# Explosive Evidence

2. **High** - reaction produces light, heat, and pressure wave that is supersonic.
  - High explosives are more complex and examples include:
    - Dynamite - is one example of a chemical explosive.
    - Dynamite is simply some sort of absorbent material (like sawdust) soaked in nitroglycerin.
    - Normally use a blasting cap to detonate dynamite.
    - There are over 30 types of high explosives.

# Explosive Evidence

- **TNT** - 2,4,6 Trinitrotoluene ( $C_7H_5N_3O_6$ ), one of the most stable of a special class of explosives called high explosives, is a yellow, odorless, crystalline solid.



# Explosive Evidence

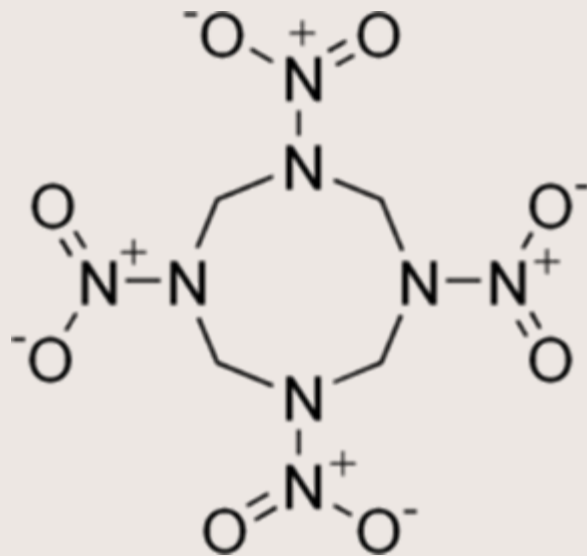
- RDX (Cyclonite, cyclotrimethylenetrinitramine) plastic bonded explosive).
- RDX= Research Department X
- C-4 is made up of explosive, binder, plasticizer and (latterly) marker or chemicals. Plastic Explosive
- As in many plastic explosives the explosive material in C-4 is RDX which makes up around 90% of the C-4 by weight.
- *All Inert by themselves so they need to be ignited.*

**C4** or **Composition C4** is a common variety of the plastic explosive known as Composition C. It is 1.34 times as powerful as trinitrotoluene (TNT)



# HMX

High Melting X or Octogen



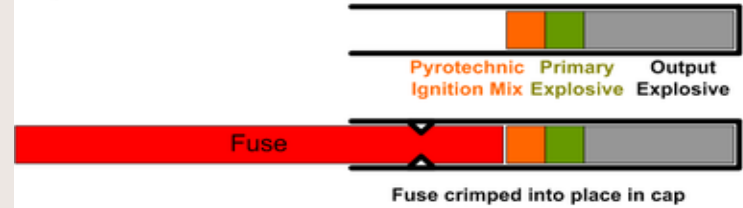


# Blasting Caps

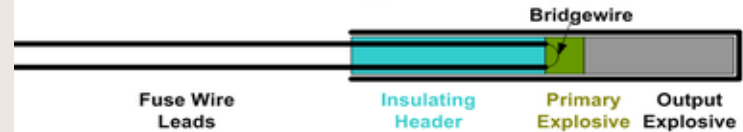
- Blasting Caps leave evidence.



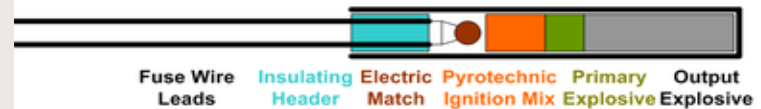
## Pyrotechnic Fuse Type Blasting Cap



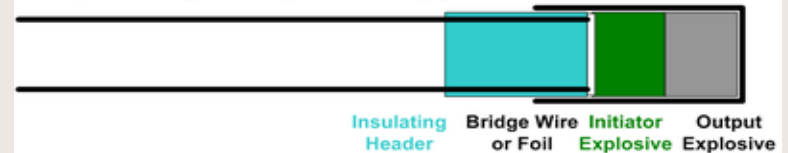
## Solid Pack Electric Type Blasting Cap



## Match or Fusehead Electric Type Blasting Cap



## Exploding Bridgewire Type Blasting Cap



## Slapper Type Blasting Cap



# Black Powder or Gun Powder

- Potassium nitrate, sulfur and charcoal mixture



- Smokeless powder is 45% black powder and 55% gas. It is not completely smoke-free

# Searching for Evidence

- An arson investigator can separate evidence collected at a fire site into three categories:
  - 1. Trace and physical evidence regularly associated with crime scenes.
  - 2. Evidence used to identify accelerants or contributing hydrocarbon based fuels.
  - 3. Documentation of evidence used to determine the origin and cause of the fire.

# Searching for Evidence

- Collect wood, rubber, or insulation as particles may be imbedded in them.
- Hard materials (metals) may have traces on the surface of them.
- All can be tested using chromatography.
- Victims bodies also can reveal clues.



# ASSIGNMENT:

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Due next class

# Research the following 5 Arson situations:

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1. Steven Benson
2. Pan Am Flight 103
3. World Trade Center 1993
4. World Trade Center 2001
5. Oklahoma City Bombing

# Research the following 5 Arson situations:

- List them in chronological order
- What year did bomb/ explosion occur
- Tell who did it
- Why that person(s) did it
- How many people died
- How many people were injured
- How much damage (in cost) was done
- Any other information