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PRESENTATION ON

HISTORY AND DEVELOPMENT- HMX SYNTHESES AND PROPERTIES

CUFS 2416 EXPLOSIVE AND POST BLAST INVESTIGATION

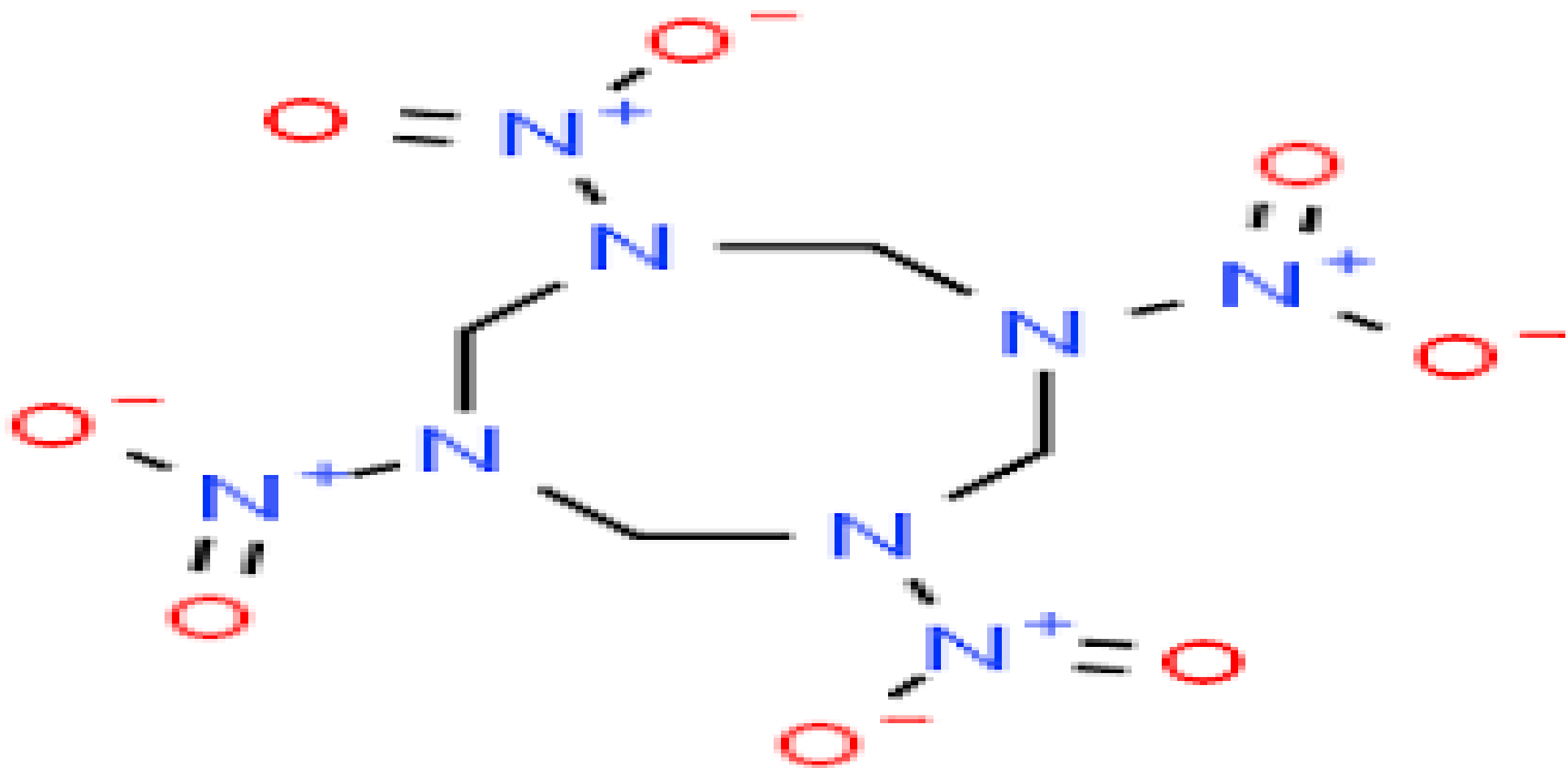
B.SC. FORENSIC SCIENCE (SEM 6)
SCHOOL OF FORENSIC SCIENCES
BHUBANESHWAR CAMPUS

CONTENT

- History and development of HMX
- Synthesis of HMX
- Properties of HMX

HISTORY AND DEVELOPMENT OF HMX

- HMX, also called Octogen, is a powerful and relatively insensitive nitroamine high explosive, chemically related to RDX.
- It is first made in 1930, and almost exclusively used in military applications.
- In 1949 it was discovered that HMX can be prepared by nitrolysis of RDX.
- Its chemical name is cyclotetramethylenetetramine.
- The molecular structure of HMX consist of an eight-membered ring of alternating carbon and nitrogen atoms, with a nitro group attached to each nitrogen atom.

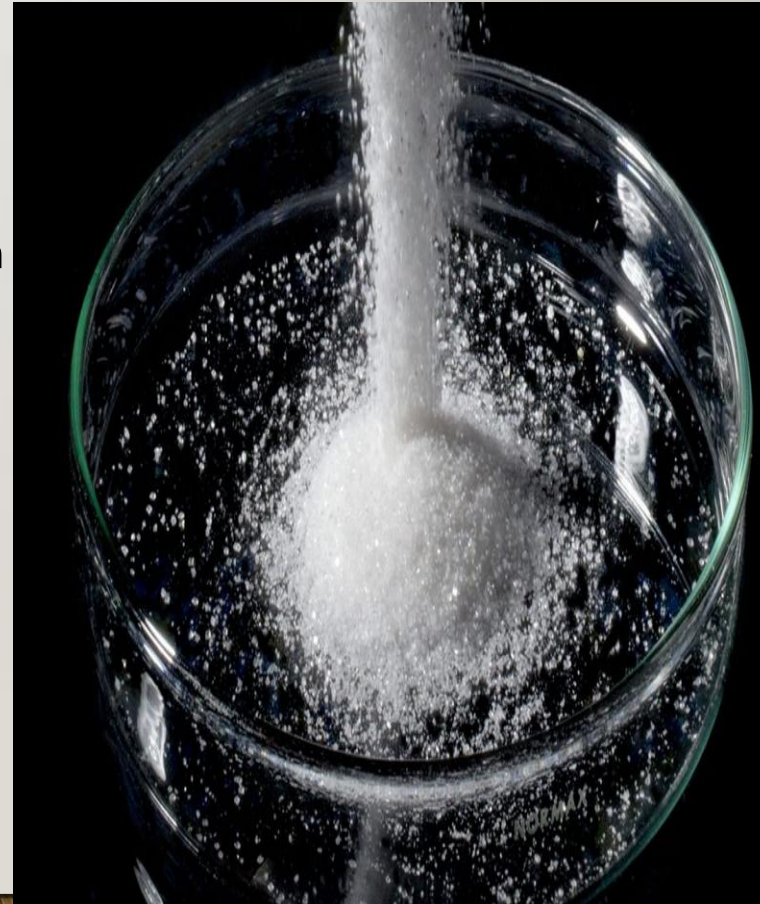


SYNTHESIS OF HMX

- HMX is more complicated to manufacture than most explosives, and this confines it to specialist applications.
- It was discovered as a byproduct during the production of RDX by the Bachmann process.
- A modification of the process would yield about 55-60% HMX with RDX as an impurity.
- It also produced by nitration of hexamine in the presence of acetic anhydride, paraformaldehyde and ammonium nitrate.
- There are polymorphs of HMX : alpha, beta, gamma, and delta.
- Military grade HMX consists only of the beta polymorph.

PROPERTIES OF HMX:-

- HMX is a white crystalline substance and is used along with other explosive.
- It will dissolve slightly in water and very small amount of HMX will turn into a vapour in the air.
- Its detonation velocity is 29,880 fps and has more density than RDX.
- It has a molar mass of 296.155 g/mol.
- Its melting point is about 276 to 286 degrees Celsius and boiling point is 906.1 degrees Celsius.
- It is not easy to decompose by alkaline hydroxide.



THANK YOU.

