Chemical Weapons and Nerve Agents

What is the issue?

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- Nerve gas is allegedly used in ongoing Syria attack.
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- It is imperative at this juncture to look into the status of chemical weapons, particularly nerve agents or nerve gases.
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What are chemical weapons?

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- It is a toxic chemical in a delivery system such as bomb or artillery.
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- Anything specifically designed for use in direct connection with the release of a chemical agent to cause death or harm is a chemical weapon.
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- Each component of a chemical weapon is a chemical weapon, whether assembled or not, stored together or separately.
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- E.g. choking agents - chlorine, phosgene, diphosgene and chloropicrin. Fluid builds up in lungs, choking victim.
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- Blister agents - sulphur mustard, nitrogen mustard, phosgene oxime, Lewisite. Burns skin, mucous membranes and eyes; causes large blisters on exposed skin; blisters windpipe and lungs.
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- Blood agents - Cyanide destroys ability of blood tissues to utilise oxygen, causing them to ‘starve’ and strangling the heart.
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- Examples include hydrogen cyanide, cyanogen chloride, Arsine, VX.
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What is CWC?

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- The Chemical Weapons Convention (CWC) is a consortium of 192 countries as signatories.
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- It seeks to limit the availability of chemicals that can be used as tools of mass destruction.
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- However, it allows member states to retain rights to use some of these chemicals for peaceful purposes such as riot control.
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- Teargas shells, for example, are frequently used for riot control.
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How is chemical weapons possession status?

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- Of the 192 CWC signatories, Albania, India, Iraq, Libya, Russia, Syria, and the US declared possession of chemical weapons.
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- Of these, Albania, India, Libya, Russia and Syria declared completion of destruction of chemical weapons.
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- Notably, by January 2016 the destruction of all chemical weapons declared by Syria has been completed.
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- Despite these, there have been continuous instances of chemical weapons attacks in Syria.
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What are nerve gases?

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- Nerve gases are among the most lethal form of chemical weapons.
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- They notably have no use other than in chemical warfare.
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- The CWC lists chemicals under various degrees of manufacturing restriction.
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- Under this, the nerve gases are among the most restricted.

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How do nerve gases work?

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- Nerve gas weakens the mechanism within the body responsible for the conduction of nerve impulses.
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- Acetylcholineesterase is a compound that catalyses the breakdown of the neurotransmitter acetylcholine.
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- Nerve gas prevents acetylcholinesterase from performing its normal function of breaking down acetylcholine.
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- It leads to the muscles going into a state of uncontrolled contraction, a sign of paralysis or a seizure-like state.
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- Death usually happens because paralysis extends to the cardiac and respiratory muscles.
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- Other symptoms could include dilation of pupils, sweating and gastrointestinal pain etc.
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- Nerve agents can also be absorbed through the skin.
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What is Novichok?

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- As restrictions on weapons are based on chemical formulae, newer molecules can bypass restrictions.
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- Countries thus started to develop newer weapons to bypass the restrictions.
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- This naturally led to the emergence of nerve agents and that is how Novichok evolved.
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- Novichok is said to be 5-8 times more lethal than VX nerve agent.
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- Also, its effects are rapid, usually within 30 seconds to 2 minutes.

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Source: Indian Express

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