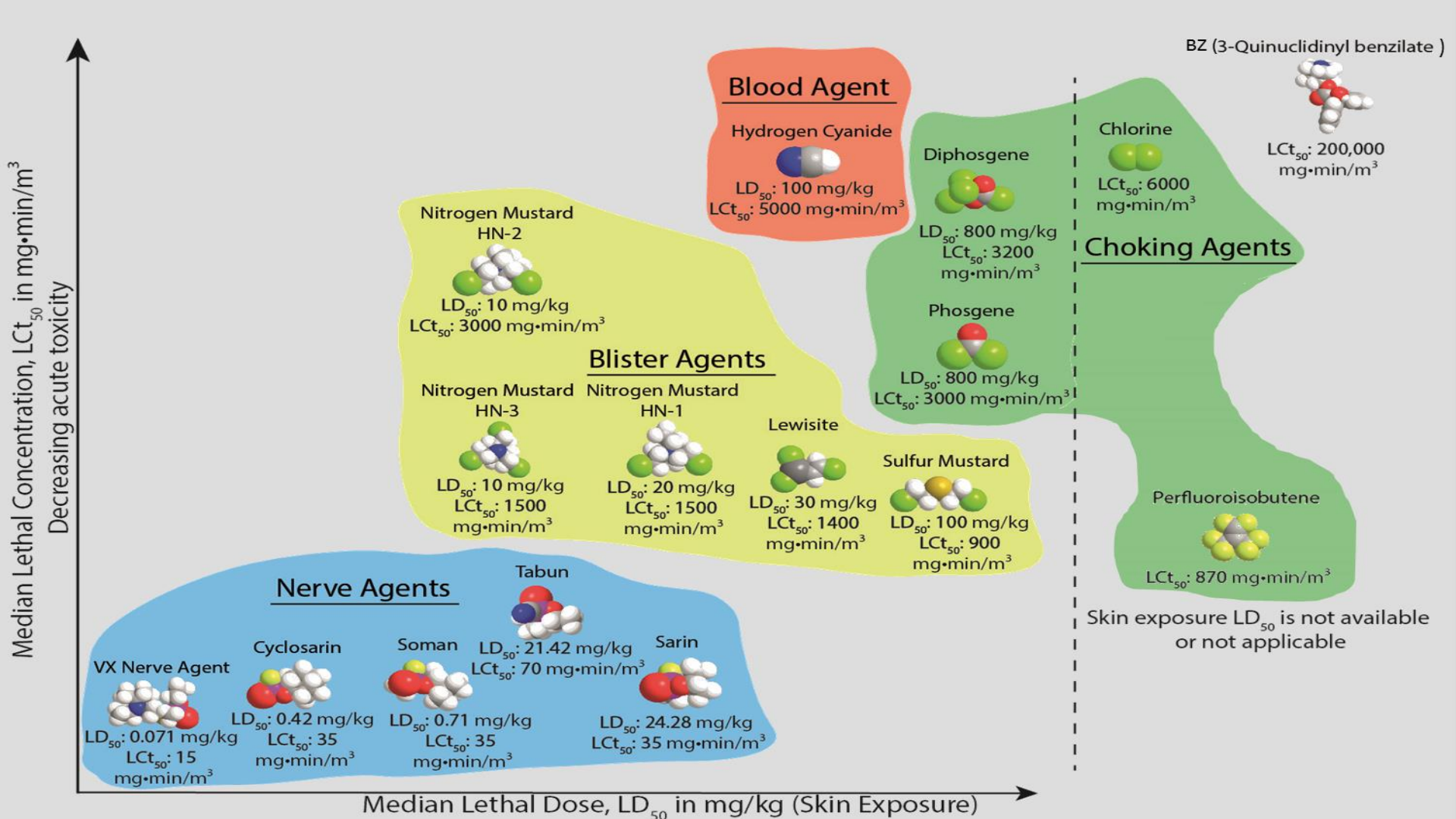
VX: A BRIEF FOR STATES PARTIES

VX background

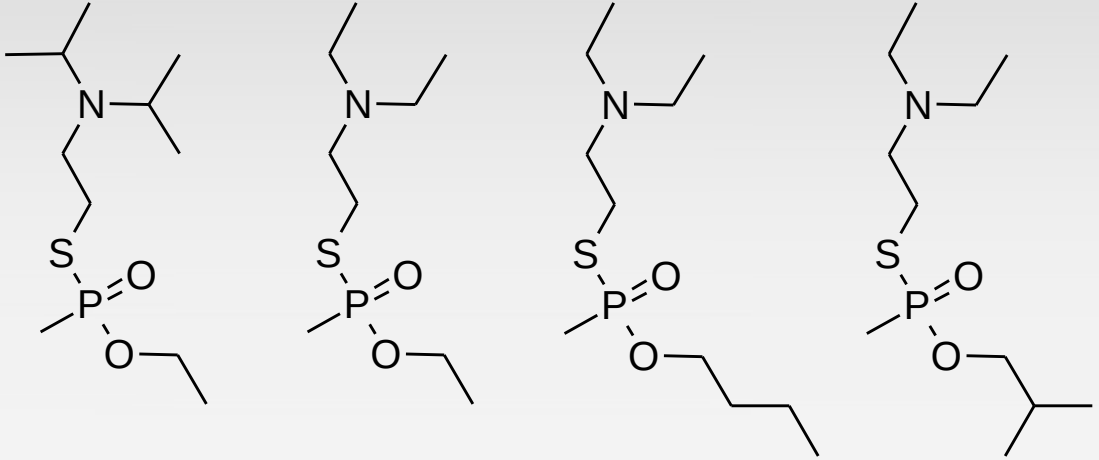
- Discovered by the British in 1952 during a commercial pesticide research programme.
- Highly toxic Nerve Agent
- Colourless liquid, but usually a pale yellow liquid.
- The only known use for VX is as a CW agent.
- Highly involatile – developed as terrain denial agents
- Under normal circumstances, there is rarely a risk of breathing in vapour, and route of exposure is invariably skin contact.
- Lack of significant vapour hinders detection.
- Readily detectable by a reasonably equipped laboratory.


Median Lethal Concentration, LCt_{50} in mg•min/m³
Decreasing acute toxicity
Median Lethal Dose, LD_{50} in mg/kg (Skin Exposure)
Blood Agent
Hydrogen Cyanide
LD_{50}: 100 mg/kg
LCt_{50}: 5000 mg•min/m³
Blister Agents
Nitrogen Mustard HN-2
LD_{50}: 10 mg/kg
LCt_{50}: 3000 mg•min/m³
Nitrogen Mustard HN-3
LD_{50}: 10 mg/kg
LCt_{50}: 1500 mg•min/m³
Nitrogen Mustard HN-1
LD_{50}: 20 mg/kg
LCt_{50}: 1500 mg•min/m³
Lewisite
LD_{50}: 30 mg/kg
LCt_{50}: 1400 mg•min/m³
Sulfur Mustard
LD_{50}: 100 mg/kg
LCt_{50}: 900 mg•min/m³
Nerve Agents
VX Nerve Agent
LD_{50}: 0.071 mg/kg
LCt_{50}: 15 mg•min/m³
Cyclosarin
LD_{50}: 0.42 mg/kg
LCt_{50}: 35 mg•min/m³
Soman
LD_{50}: 0.71 mg/kg
LCt_{50}: 35 mg•min/m³
Tabun
LD_{50}: 21.42 mg/kg
LCt_{50}: 70 mg•min/m³
Sarin
LD_{50}: 24.28 mg/kg
LCt_{50}: 35 mg•min/m³
Choking Agents
Diphosgene
LD_{50}: 800 mg/kg
LCt_{50}: 3200 mg•min/m³
Chlorine
LCt_{50}: 6000 mg•min/m³
Phosgene
LD_{50}: 800 mg/kg
LCt_{50}: 3000 mg•min/m³
Perfluoroisobutene
LCt_{50}: 870 mg•min/m³
BZ (3-Quinuclidinyl benzilate)
LCt_{50}: 200,000 mg•min/m³
Skin exposure LD_{50} is not available or not applicable

Various V agents

A number of Schedule 1.A.03 chemicals have been researched and/or stockpiled.

The toxicity of all these agents is presumed to be similar

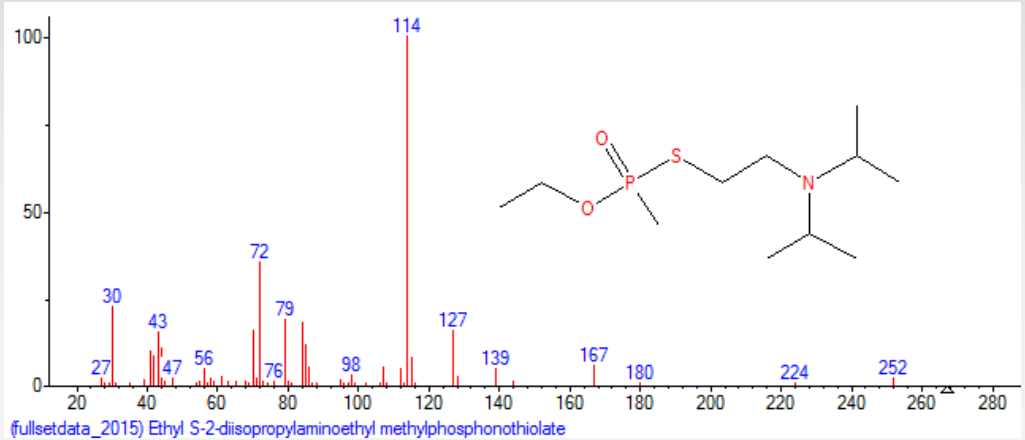


Synthesis of VX

- VX may be synthesized in a multi-step process
  - There are a variety of pathways to create VX
  - Most pathways require other scheduled chemicals
  - Pure VX requires stabilizers for long term storage
- VX may be made as a binary agent
  - Two relatively harmless chemicals can be mixed to create VX
  - There are at least two binary VX formulations

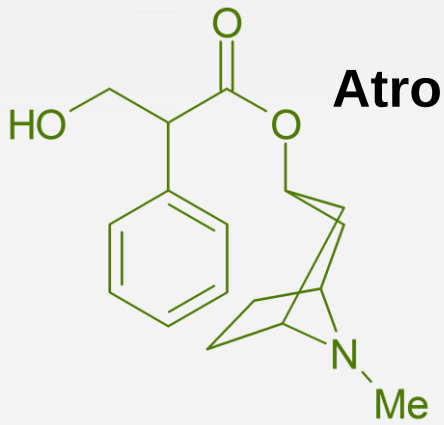
Analysis of VX

- Gas Chromatography - Mass Spectrometry may be used to analyze for VX and its degradation products
- Library data (e.g. OCAD) may be used for the identification



Medical Countermeasures

- ATROPINE: an anticholinergic that limits the effects of excess neurotransmitter at the synapse – anti-muscarinic effects
- PRALIDOXIME (2-PAM Cl or P2S): a cholinesterase re-activator that chemically attacks the bound agent. Must be administered quickly
- DIAZEPAM: an anticonvulsant to counter the symptoms of nerve agent poisoning



Atropine

Decontamination

- Oxidation is the best decontamination process for VX
- Traditional household chlorine bleach may be used full-strength to decontaminate surfaces
- A 1:10 dilution of bleach in water may be used to decontaminate skin.