

Dual- use Chemical: From an awareness and safety perspective

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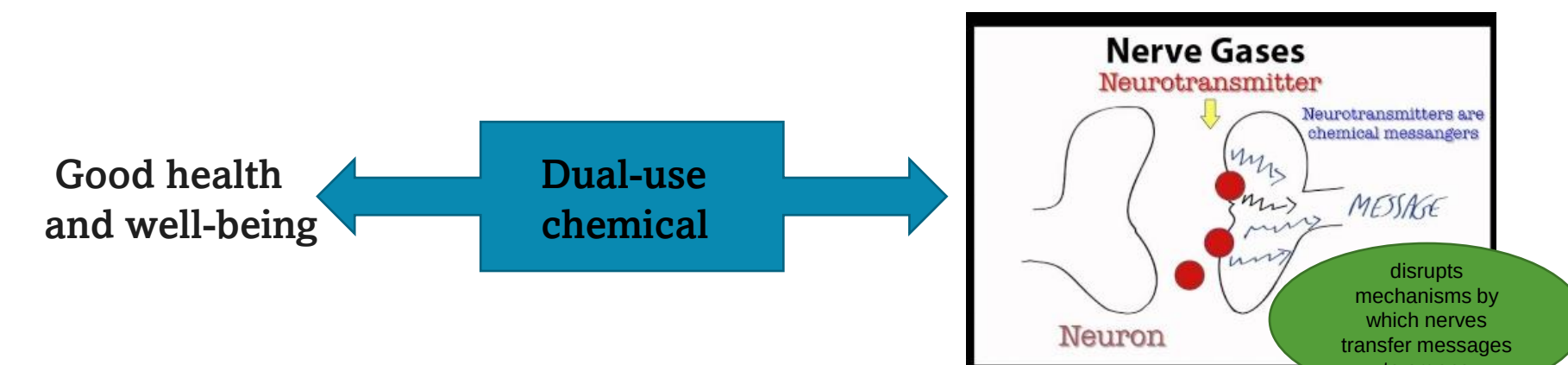


Introduction

❖ In this Chemical Safety and Awareness compilation we bring to light how some chemicals are very useful and keep us healthy and protected, but...

❖ These chemicals can also cause detrimental effects if they fall in the wrong hands as they can be used as chemical warfare.

❖ Chlorine, for example, is a commercial solvent used in the laboratory and industry. However, when used for military purposes, it becomes a devastating chemical weapon. Chlorine is a typical example of a **dual-use chemical**.



❖ Due to their legitimate and malicious nature dual-use chemicals are regulated by international chemical control bodies.

❖ These bodies work in synergy with UN-organizations, at multiple levels, to achieve, amongst other obligations, the 17 United Nations Sustainable Development Goals (SDGs) listed in **Fig. 1**



Figure 1. The 17 Sustainable Development Goals (SDGs). Safe and sound chemical management is central to achieve SDGs.

International Chemical controls



Implementing body of the Chemical Weapons Convention (CWC)
❖ Have listed chemicals as Scheduled Chemicals 1, 2 and 3 based on level of toxicity or if it's a precursor

The Australia Group

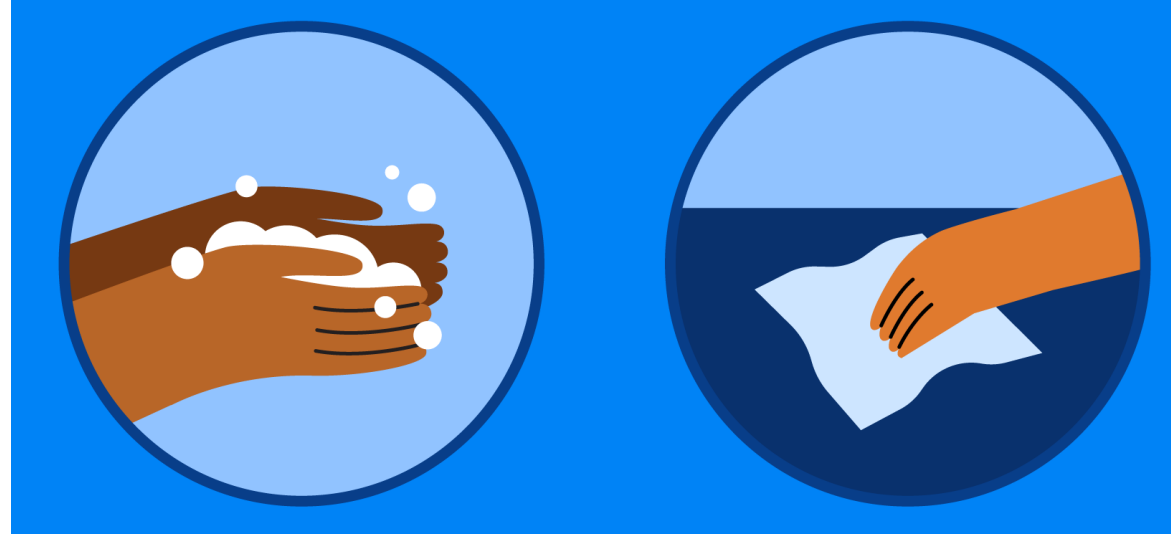
Identifies exports that may contribute to chemical weapons
❖ Controls dual-use manufacturing facilities



Controls conventional arms & dual-use goods and technologies.
❖ Review items on dual-use list

A dual-use chemical can promote technology, human development and strengthen economic ties, but equally pose a potential risk not only to international security objectives but to SDG 3: “Ensure healthy lives and promote well-being for all at all ages”

Common Prevention Tips



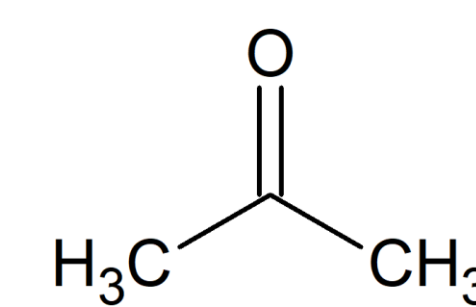
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❖ Clean hands often and disinfect frequently touched surfaces at home

❖ Dual-use chemicals are part of the compounds that manufacture disinfectants/sanitizers

Amidst the covid-19 pandemic, risk assessment and sound chemical management, as we strive to stay healthy, will come a long way...

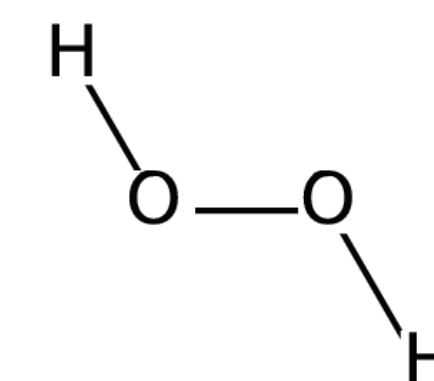
Retail Sales



Acetone

Explosives TATP

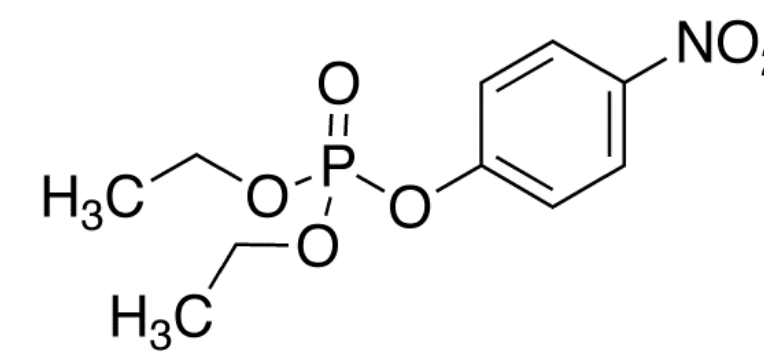
Used in nail polish remover



Hydrogen Peroxide

Explosives

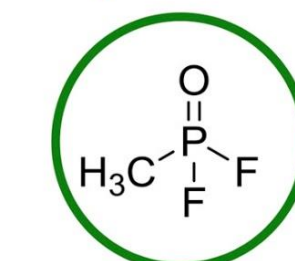
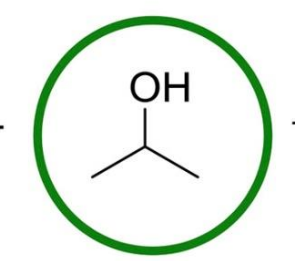
Used in bleaching agents e.g., Jik



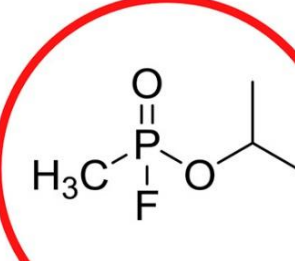
Insecticides / Pesticides

Chemical based Weapons

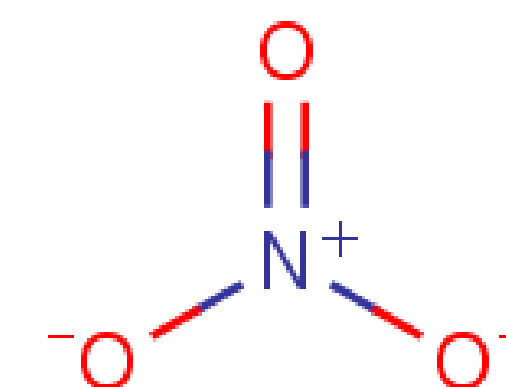
harmless precursors



extremely toxic



sarin



Ammonium Nitrates

Explosives



Commonly used in fertilizers as well as in explosives for mining and construction projects



Thiodiglycol

Chemical based weapons

Readily available chemical used;

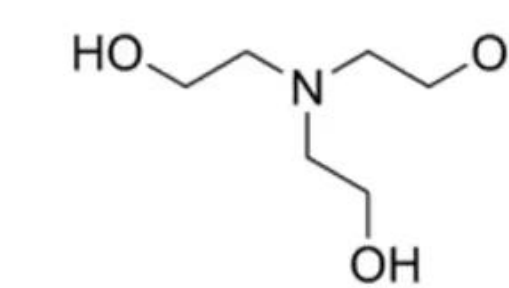
- ❖ for dyes in textile printing and photo developing solutions.
- ❖ as co-solvent in water-based ink for ball-point pens.

But one step from mustard gas (blistering and often lethal chemical warfare agent)

© OPCW

Industry: Formulations / Cement

CHEMICAL



SPECIFIC USES

- Specialty Concretes Reinforced
- Additive to hundreds of products from cutting oils to corrosion inhibitors
- Cosmetics



CLASS

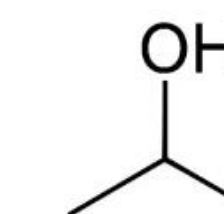
Triethanolamine
3.B.17

CONCERN WHY?

One step away from production of the blister agent nitrogen mustard (1.A.6)

Industry: Pharmaceuticals/ Cosmetics

CHEMICAL



SPECIFIC USES

Solvent for coatings or for industrial processes
Hand sanitizer
Laboratory use
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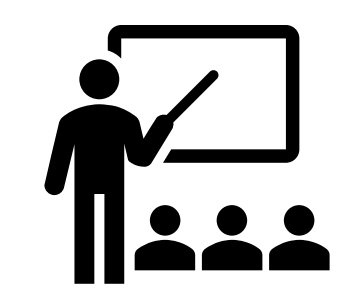
CLASS

Isopropanol

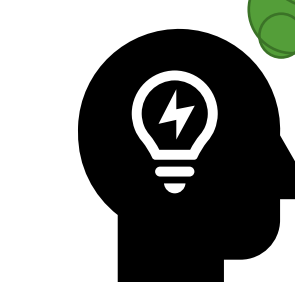
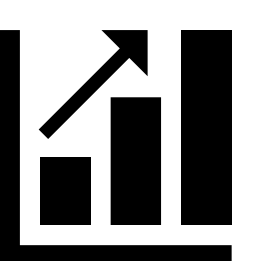
CONCERN WHY?

Anhydrous isopropanol is the chemical used in the last step in producing nerve agents **chlorosarin** (1.B.11) and **sarin** (1.A.1).

Scientific Motivation



When analyzing, synthesizing and transforming matter, do we pay sufficient attention to the implications of our activities



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Acknowledgements

Ministry of Defense, Justice and Security
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Botswana