Science for Diplomats at EC-83

Chemical Weapons Sample Stability and Storage

12 October 13:30 – 14:45
Ooms Room

(light lunch available at 13:00)

Dr Christophe Curty
Spiez Laboratory

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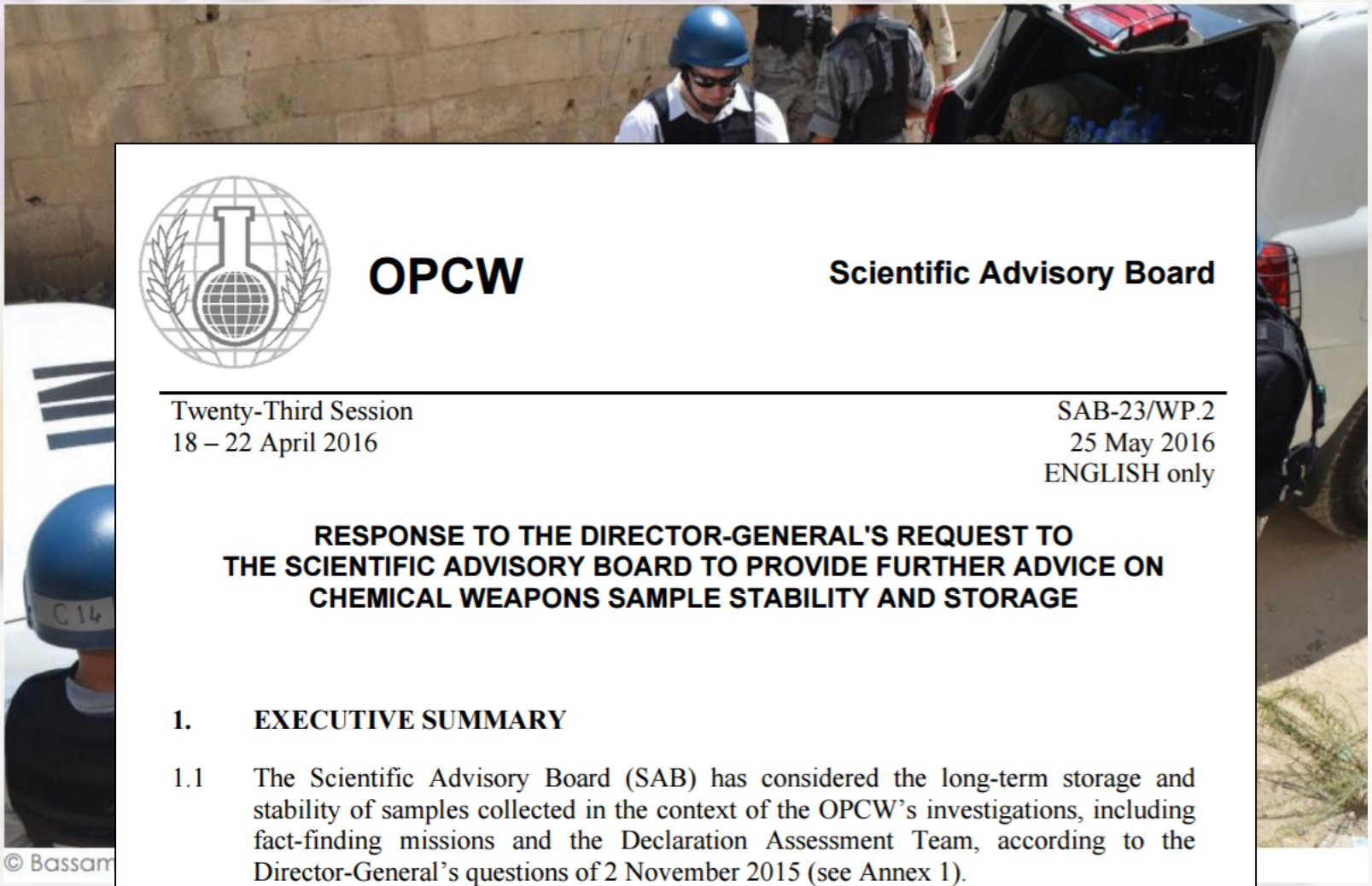
Samples Collected in OPCW Investigations

© Bassam Khabieh/Reuters

Samples Collected in OPCW Investigations



OPCW — **Scientific Advisory Board**

Twenty-Third Session
18 – 22 April 2016

SAB-23/WP.2
25 May 2016
ENGLISH only

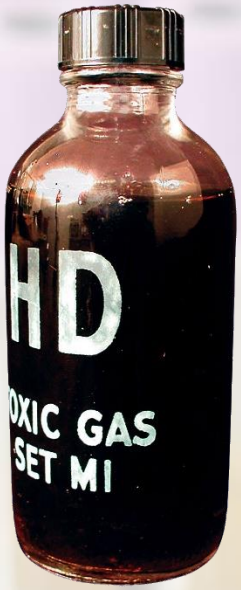
RESPONSE TO THE DIRECTOR-GENERAL'S REQUEST TO THE SCIENTIFIC ADVISORY BOARD TO PROVIDE FURTHER ADVICE ON CHEMICAL WEAPONS SAMPLE STABILITY AND STORAGE

1. EXECUTIVE SUMMARY

1.1 The Scientific Advisory Board (SAB) has considered the long-term storage and stability of samples collected in the context of the OPCW's investigations, including fact-finding missions and the Declaration Assessment Team, according to the Director-General's questions of 2 November 2015 (see Annex 1).

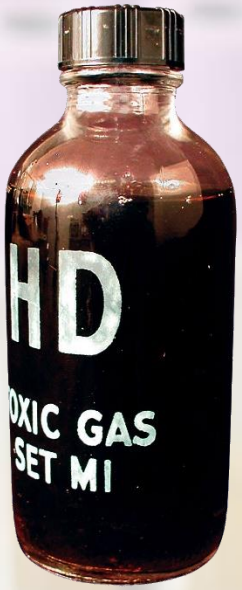
1.2 In the context of the OPCW's investigations, the Technical Secretariat has since 2013 received numerous samples, which are stored in the OPCW Laboratory at room temperature or refrigerated at 4 °C.

Sample Types



Bulk chemicals

Sample Types



Bulk chemicals

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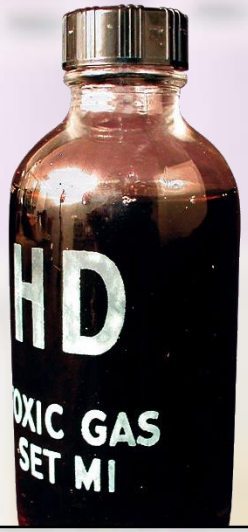


Bulk chemicals

Biomedical samples

Highly variable concentration and heterogeneous samples

Director-General's Request for Advice on Long-Term Storage and Stability of Samples Collected in Relation to the Potential Use of Chemical Weapons

In reference to the sample types described on the previous slide:

- Given the current storage conditions in the OPCW Lab (typically room temperature or 4°C), how quickly and through what process would samples degrade to a point where analysis of the samples would likely no longer return credible results?

- What are the best-practice conditions for long-term sample storage?

- Given these best-practice storage conditions, how quickly and through what type of process could samples degrade to a point where analysis of the samples would likely no longer return credible results?

Presentation by Dr Christophe Curty

ORGANISATION FOR THE PROHIBITION OF CHEMICAL WEAPONS

Working Together For a World Free of Chemical Weapons

Recommendations From The OPCW Scientific Advisory Board's Report on Verification

Recommendation 1

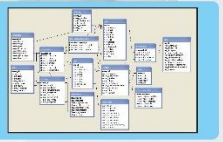
The Secretariat should consider adopting a comprehensive, more analytical approach to verification utilising all available and verifiable information.

Recommendation 2

The Secretariat should acquire the capability to use open-source information on a routine basis.

Recommendation 3

The Secretariat should put in place an information management structure that can provide the support required for the verification process.

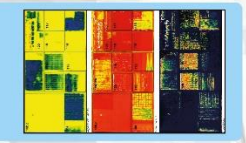


Recommendation 4

Remote/automated monitoring technologies should be added to the list of approved inspecti on equipment.

Recommendation 5

The Secretariat should look into the option of using satellite imagery for the planning of non-routine missions, in particular for IAU and CI.



Recommendation 6

The Secretariat should visit the National Authorities to obtain assurance on the accuracy and completeness of declarations. The outcome of such visits may impact on the inspection frequency.

Recommendation 7

The Secretariat must commission an independent review of all activities pertaining to the missions carried out in the Syrian Arab Republic.

Recommendation 8

The list of declarable OCPFs submitted by States Parties should include all facilities which fall under the definition/requirement of paragraph 1 of Part IX of the Verification Annex, regardless of the purity level of a DOC or DOC mixtures produced.

Recommendation 9

Not all facilities that fall under Part IX of the Verification Annex should be considered of the same relevance to the object and purpose of the Convention. The TWG recommends a practical approach for enhancing the utilisation of verification resources for OCPF declaration and on-site inspection processes.

Recommendation 10

The verification thresholds for OCPFs producing highly relevant chemicals, and the possibility of revision of the product group codes, should be addressed by the SAB as well as the industry cluster.

Recommendation 11

The OPCW should increase the staff of the OPCW Laboratory to cope with various aspects of IAU, biomedical samples, trace environmental analysis, toxins, and on-site analysis. Establishing a network of DLs for biomedical sample analysis should be a high priority.

Recommendation 12

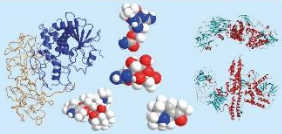
Lessons on chemical sampling and analysis from the OPCW's support to the 2013 United Nations Mission to Investigate the Use of Chemical Weapons in the Syrian Arab Republic, and all subsequent OPCW activities in relation to the Syrian Arab Republic must be identified and implemented.

Recommendation 13

PTs should incorporate a broader range of chemicals, and at a wider range of concentrations, to prepare laboratories for IAU-type scenarios.

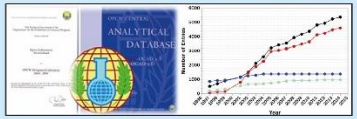
Recommendation 14

The Secretariat should expedite toxin identification exercises.



Recommendation 15

Continuous additions to the OPCW Central Analytical Database (OCAD) are recommended to allow the OPCW to meet all its mandated inspection aims, including IAU.

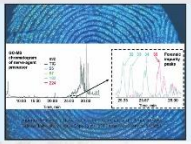


Recommendation 16

Developments in analytical instrument portability, miniaturisation and disposable biosensors should be periodically reviewed by the Secretariat and the SAB for potential applicability to on-site analysis.

Recommendation 17

The Secretariat should monitor developments in attribution analysis/chemical forensics.



Recommendation 18

The Secretariat should augment its capability to monitor and forecast developments in science and technology of relevance to the Convention and its verification regime.

https://www.opcw.org/special-sections/science-technology/science-technology-monitor/

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Report available at: https://www.opcw.org/fileadmin/OPCW/SAB/en/Final_Report_of_SAB_TWG_on_Verification_-_as_presented_to_SAB.pdf

ORGANISATION FOR THE PROHIBITION OF CHEMICAL WEAPONS

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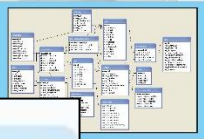

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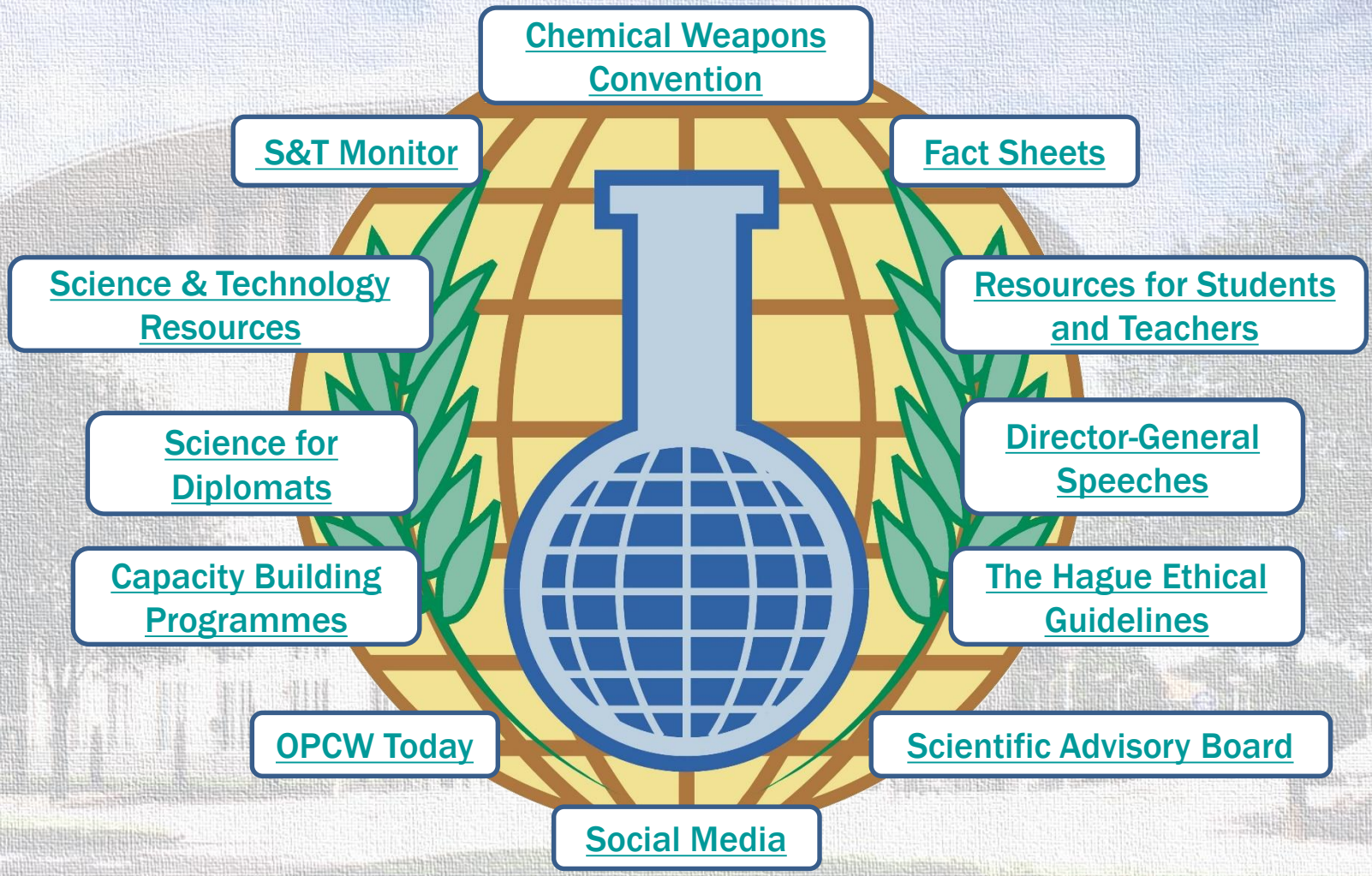
Report available at: https://www.opcw.org/fileadmin/OPCW/SAB/en/Final_Report_of_SAB_TWG_on_Verification_-_as_presented_to_SAB.pdf

SAB Report on Sample Stability and Storage

- A comprehensive review of scientific literature combined with best practices on storing samples relevant to chemical agents.
- Provides reference information on breakdown products of chemical warfare agents.
- No other compilation of this kind is known to be available in scientific literature.
- The Director-General has encouraged the SAB to publish the review in an appropriate scientific journal (*See EC-82/DG.13*).
- A resource for those whose work involves sampling and analysis of chemical agents

Science and Technology Resources



https://www.opcw.org/special-sections/science-technology/science-technology-resources/

Science and Technology Resources

The OPCW Science & Technology Monitor

Volume 3 Number 3

A sampling of Science & Technology Relevant to the Chemical Weapons Convention

6 July 2016

In this Issue

Medicines, Drugs and Incapacitants: CNS Acting Chemicals

Artificial Intelligence

SAB, ABEO and OPCW Day reports

Welcome

Welcome to the OPCW Science and Technology Monitor, an occasional bulletin providing updates on developments in science and technology across a broad spectrum of topics relevant to the CWC. Past issues (and more) can be found on the Science and Technology section of the OPCW website.

This third issue of 2016 comes on the 19th anniversary of the day that Mars rover Sojourner became the first man-made vehicle to travel across the surface of another planet. Sojourner was designed to operate for one week, yet operated and produced data for nearly three months. Today on Earth, autonomous vehicles (many larger and equipped with more instruments than Sojourner) are becoming more and more commonplace. In the spirit of the mars rovers, autonomous systems that can collect and transmit information (including from environments dangerous to humans) open up many opportunities for scientific applications and even for detecting chemical weapons.

The S&T Puzzle

Congratulations go out to our first puzzle winner from OPCW's International Cooperation and Assistance Division (ICA). One of the ICA's interns took the prize on what he decribed as a "befodding task". Puzzle statistics now stand at: VER 6, CTBTO 5, OSP 2, OCS 1, INS 1 and ICA 1. The answers can be found on the last page!

For this edition of the puzzle, we challenge you to recognize the "Sounds of the OPCW". The first person to correctly identify the five below wins the prize: your choice of requesting a featured topic, designing a puzzle or receiving a beverage hand selected by the Science Policy Advisor. Send answers to scitech@opcw.org. Good luck!

- Sound 1
- Sound 2
- Sound 3
- Sound 4
- Sound 5

S&T ... ets

Science & Techno ... Resources

... urces for Students ... and Teachers

Science fo ... Diplomats

... ector-General ... Speeches

Capacity Build ... Programme

... Hague Ethical ... Guidelines

OP ...

... Advisory Board

https://www.opcw.org/special-sections/science-technology/science-technology-resources/

OPCW

OPCW Scientific Advisory Board Briefing to States Parties

Friday 28 October 13:30 - 15:00

Ooms Room

(light lunch available from 13:00)

"WORKING TOGETHER FOR A WORLD FREE OF CHEMICAL WEAPONS"

Spiez Laboratory & OPCW Present Science for Diplomats at CSP-21

Wednesday 30 November 2016
Europe Room, World Forum
13:00 – 15:00

A Review of three workshops: Spiez CONVERGENCE 2, and the OPCW SAB's Chemical Forensics and Toxicity of Chemical Agents