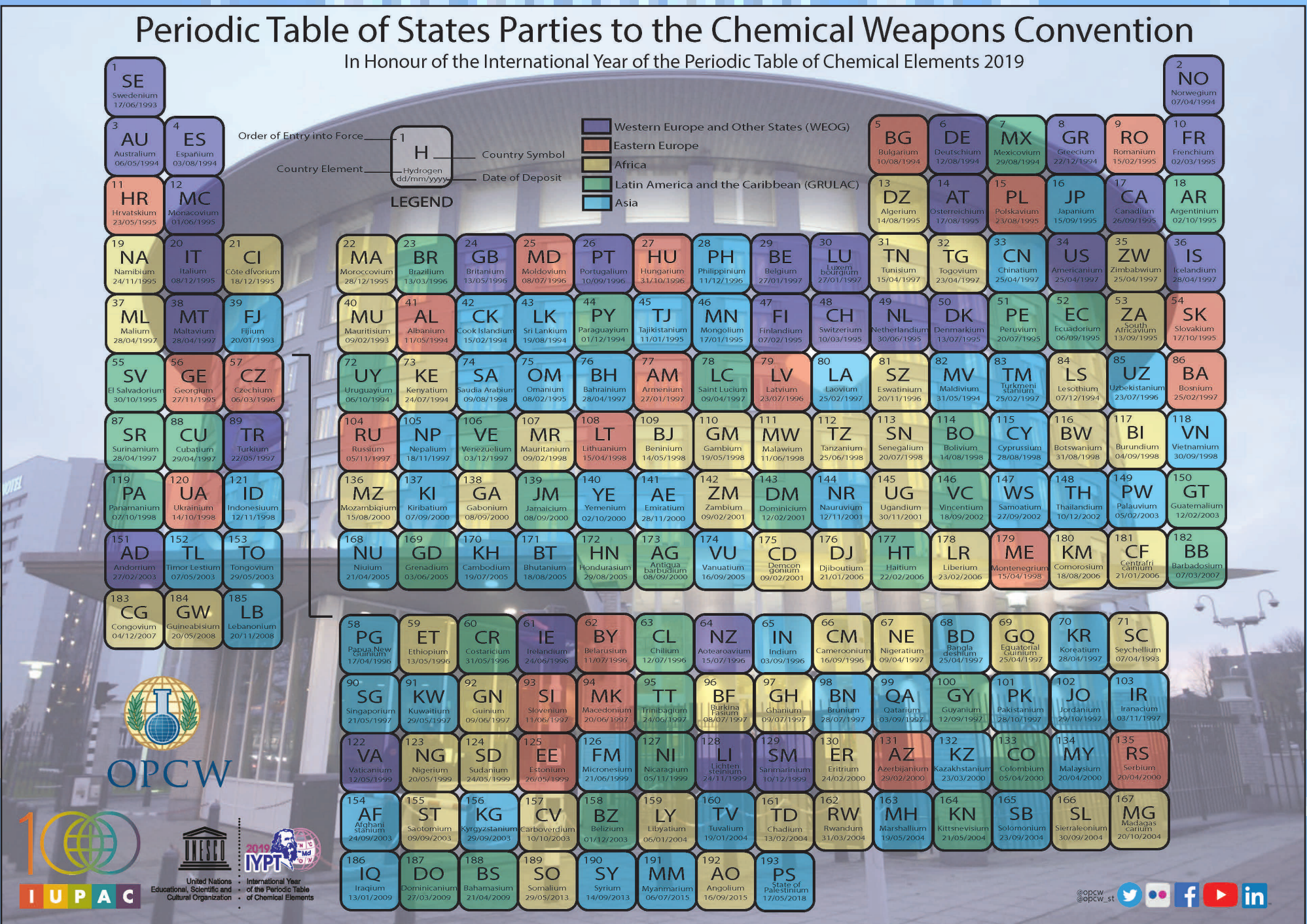




**What is OPCW?**  
  
Scan me!

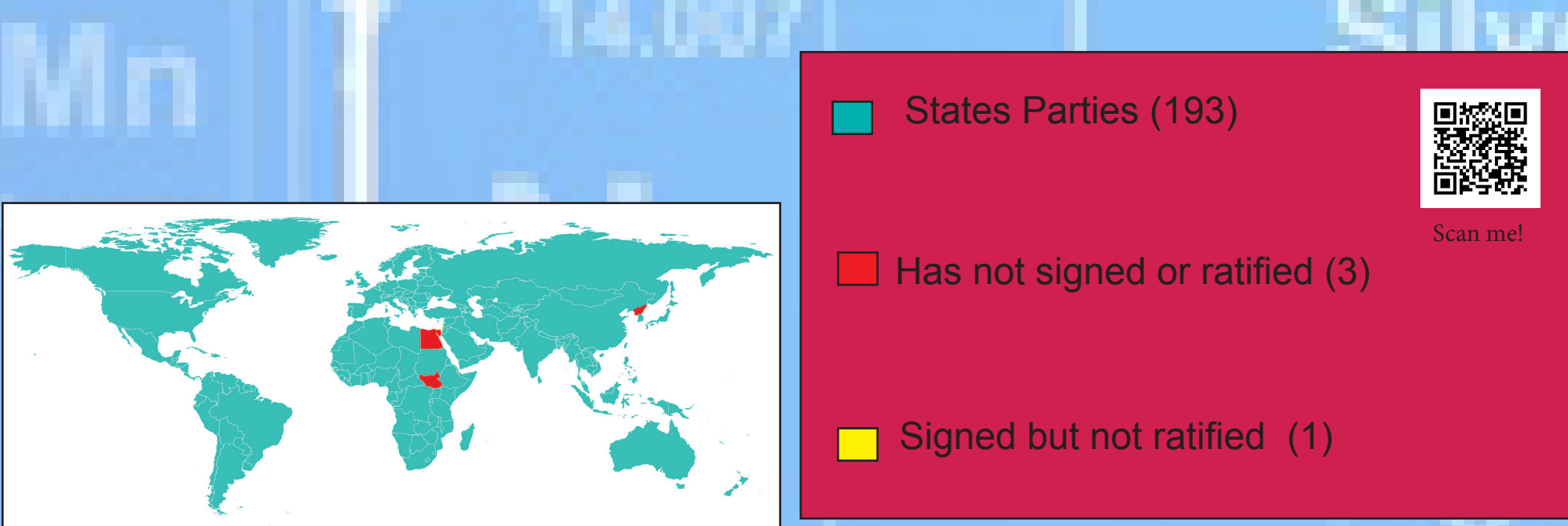
The Organisation for the Prohibition of Chemical Weapons (OPCW) is the implementing body of the Chemical Weapons Convention, an international disarmament and non-proliferation treaty with a membership of 193 of the world's States. The Convention has been in force since 1997. The 193 Member States of the OPCW share a collective vision of a world free of chemical weapons and the threat of their use, where cooperation for peaceful uses of chemistry is fostered.



**The Periodic Table of the States Parties**

A representation of the 193 States Parties of the Chemical Weapons Convention as a "Periodic Table". This graphic was created in honour of the 2019 International Year of the Periodic Table and presented to States Parties in November 2019. The "elements" are ordered from 1 to 193 by the chronology of entry into force of the Convention within each State (with the date of deposition used to order States that simultaneously became States Parties).

Scan me!



# Building Broader and Deeper Links Between OPCW and IUPAC

Ayah Wafi

OPCW Office of the Science Policy Adviser

The Organisation for the Prohibition of Chemical Weapons (OPCW) and the International Union of Pure and Applied Chemistry (IUPAC) have established an exchange programme to allow more members of each organisation to observe one another in action and develop ideas for enhancing collaborations to promote the peaceful use of chemistry. This project kicked off in November 2018, when representatives of IUPAC Divisions and Standing Committees came to The Hague and presented their work at the Fourth Review Conference of the States Parties of the Chemical Weapons Convention.

## IUPAC-OPCW Partnership

In 2016, IUPAC and OPCW signed a Memorandum of Understanding to cooperate across their common goals of using chemistry for peaceful purposes and facilitating the exchange of scientific information for making the world a better place.

Scan me!

## The Hague ethical guidelines



The Hague Ethical Guidelines are intended to serve as elements for ethical codes and discussion points for ethical issues related to the practice of chemistry under the Convention. IUPAC and the International Council of Chemical Associations (ICCA) have endorsed these guidelines to promote the responsible practice of chemistry.

**Key Elements**

Education

Sustainability

Accountability

Ethics

Awareness and Engagement

Oversight

Exchange of information

Scan me! The Hague Ethical Guidelines

Safety and Security

## Supporting the Review of Science and Technology



Scientific Advisory Board website



The Scientific Advisory Board (SAB) is a subsidiary body of the OPCW that enables the Director-General to render specialised advice in science and technology to the States Parties of the Chemical Weapons Convention. Every five-years (so far in 2003, 2008, 2013 and 2018) States Parties undertake a comprehensive review of the implementation of the Convention. The SAB prepares a report on developments in science and technology to inform this review. In the lead up to each Review Conference, IUPAC has co-organised workshops with the SAB that contribute to the scientific review and provide inputs for the report delivered to States Parties.

Scan me!

Scan me!

Scan me!

Scan me!

The IUPAC workshops held in the lead up to the First, Second and Third Review Conferences formed the basis of the reports of the SAB. In the lead up to the Fourth Review Conference in 2017, IUPAC co-organised a workshop on emerging technologies with The USA National Academies of Science, the Brazilian Academy of Sciences, the Brazilian Chemical Society and the SAB which provided inputs to the verification section of the SAB report to States Parties. The Fourth Review Conference report and papers based on the presentations from the 2017 workshop were featured in a special issue of *Pure and Applied Chemistry*.



**OPCW and the International Union of Pure and Applied Chemistry**

Reflecting on and Taking Forward a Partnership with the Scientific Community

**21 November 13:00 - 15:00**  
**Antarctica Room**  
**World Forum**  
Light lunch provided.

INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY

Organisation for the Prohibition of Chemical Weapons



A standing room only audience that included representatives of States Parties, scientists and OPCW staff members.

**IUPAC** ADVANCING CHEMISTRY WORLDWIDE

**IUPAC Division I – Physical and Biophysical Chemistry**

Provides the world standard for clear definitions and meaning of terminology, nomenclature, symbols and units

Encourages compilation and documentation of critically evaluated physical, biophysical, biochemical chemical data including those related to chemical weapons, their detection and disposal

Promote future oriented activities in physical, biophysical, biochemistry chemistry important for sustainable development

Scan me!

**IUPAC** ADVANCING CHEMISTRY WORLDWIDE

**IUPAC Division VII Chemistry and Human Health**

**Nomenclature for Properties and Units:**  
Development of a universal terminology in Clinical Chemistry

**Drug Discovery and Development:**  
International activities to promote the design of novel therapeutic drugs.

**Toxicology and Risk Assessment:**  
Compilation of glossaries as worldwide basis for chemical risk assessment.

**Possible Areas for Cooperation with OPCW**  
Global protection from chemical hazards and ban of chemical weapons.

Scan me!

**IUPAC** ADVANCING CHEMISTRY WORLDWIDE

**IUPAC Division II – Inorganic Chemistry**

The Division's **major areas** of focus are (1) isotopic abundances and atomic weights; (2) molecular inorganic chemistry; and (3) solid-state inorganic and materials chemistry.

**Commission on Isotopic Abundances and Atomic Weights (CIAAW).**  
3 Subcommittees: Isotopic Abundance Measurements; Stable Isotope Reference Material Assessment; Natural Assessment of Fundamental Understanding of Isotopes.

Interactive online version of the Periodic Table has been made and updated, as well as the Periodic Table of Isotopes.

**Interdivisional Subcommittee on Materials Chemistry**

The Inorganic Chemistry Division is also the body within IUPAC that works with IUPAP on the **verification of claims** for and the naming of **new chemical elements**.

Scan me!

**IUPAC** ADVANCING CHEMISTRY WORLDWIDE

**IUPAC Division VIII - Nomenclature**

Development of unique and interoperable nomenclature for chemical materials

• Unique and unambiguous identification

Interface with databanks for properties through:

• Name

• Computer readable unique descriptor (InChI™ or SMILES)

• Structural formula

Strain: O-bisopropyl methylphosphonate  
IUPAC Name: 2-bis(isopropoxy)phosphinic acid

$R^1 = i\text{-Pr}$   
 $R^2 = \text{Me}$

Scan me!

**IUPAC** ADVANCING CHEMISTRY WORLDWIDE

**IUPAC Division III - Organic and Biomolecular Chemistry**

**Division III could contribute to IUPAC-OPCW collaboration**

**Division III could contribute to IUPAC-OPCW collaboration providing advice in:**

• Defining criteria for selecting new toxicants and their cataloguing

• Selecting organic compounds for cataloguing as CW

• Selecting chemical weapon exposure metabolites (including bio-adducts) and destruction products for cataloguing

• Selecting potential antidotes that could be used

• Development of chemical weapons destroying protocols and ecological monitoring

Scan me!

**IUPAC** ADVANCING CHEMISTRY WORLDWIDE

**IUPAC Committee on Chemistry and Industry**

**Organization of educational researchers and lecturers**

• To develop relationships for working collaboratively with groups both inside and outside of IUPAC presentation of the IUPAC activities in the implementation of United Nations Sustainable Development Guide and of The Strategic Approach to International Chemicals Management (SAICM)

• To continue supporting initiatives that raise awareness, social responsibility, and understanding the nature of science as well as of environmental and ethical issues that are related to chemistry

• To initiate programs on promoting chemistry education and public understanding of chemistry for developing countries

Scan me!

**IUPAC** ADVANCING CHEMISTRY WORLDWIDE

**Polymer Division (IV)**  
Polymer: large molecule, composed of many repeating units

**Polymer Terminology**

-Defining standards : adding IUPAC boxes to Wiki

- > 75 boxes added, plus concepts defined

- **New project OPCW: terminology / overview sensors**

**Modeling Polymerization Kinetics and Processes**

- Critical paper: How fast is polymerization?

- > 500 citations

**Polymer Education**

-Free resources : website (different languages)

-Exchanging best practice

- Example projects: biodegradable materials

- Defining standard (ISO) procedures

Scan me!

**IUPAC** ADVANCING CHEMISTRY WORLDWIDE

**Interdivisional Committee on Green Chemistry for Sustainable Development, ICGSD**

**The Interdivisional Committee initiates, promotes, and coordinates the work of the Union in the area of green and sustainable chemistry.**

**ICGSD is responsible for the promulgation of the work of the Union in green and sustainable chemistry through interaction with other relevant international chemical and non-chemical organizations with a common interest.**

Scan me!

**IUPAC** ADVANCING CHEMISTRY WORLDWIDE

**IUPAC Division VI - Chemistry and the Environment**

**We share the vision of OPCW especially on Chemistry for Peace and the sound management of chemicals.**

*The Division provides authoritative reviews and guidance on the fate, behaviour and risks of chemical compounds in food and the environment. It has an extensive network of experts around the globe.*

Collaboration with OPCW should encompass:

• Risk assessment of chemicals

• The environmental footprints of chemical and radioactive materials/weapons as well as their transformation products – during manufacture and if used.

• Safe disposal of restricted chemicals

Scan me!

**IUPAC** ADVANCING CHEMISTRY WORLDWIDE

**IUPAC Committee on Chemistry Education**

**Organization of educational researchers and lecturers**

• To develop relationships for working collaboratively with groups both inside and outside of IUPAC presentation of the IUPAC activities in the implementation of United Nations Sustainable Development Guides and of The Strategic Approach to International Chemicals Management (SAICM)

• To continue supporting initiatives that raise awareness, social responsibility, and understanding the nature of science as well as of environmental and ethical issues that are related to chemistry

• To initiate programs on promoting chemistry education and public understanding of chemistry for developing countries

Scan me!



What is IUPAC?



The International Union of Pure and Applied Chemistry (IUPAC) is a non-governmental, non-profit global organisation that provides objective scientific expertise and develops essential tools for application and communication of chemical knowledge. IUPAC's mission is to globally unite chemists by fostering sustainable development, providing a common language for chemistry, and advocating free exchange of scientific information for the benefit of our world.

In 2019, IUPAC celebrates its 100th anniversary.



## IUPAC has Supported OPCW for Many Years

Areas of focus include updating, piloting, and disseminating educational materials for raising awareness of the multiple uses of chemicals and the Chemical Weapons Convention.

Projects have included the Hague Ethical Guidelines as well as the Multiple uses of Chemicals website, an educational platform regarding the use and misuse of chemicals. It serves to teach students, teachers and policy-makers about the norms and values of the Chemical Weapons Convention. The materials also address conduct and ethics in the practice of chemistry.



Multiple Uses of Chemicals Website



Thematic content of the SAB Report to the Fourth Review Conference



IUPAC president, Professor Qifeng Zhou addressing the States Parties of the Fourth Review Conference on 23 November 2018.

In collaboration with the SAB and the OPCW Science Policy Adviser, IUPAC presented a side event at the Fourth Review Conference to raise awareness amongst diplomats from the States Parties on the work of IUPAC and its long-standing cooperation with OPCW. The divisions and committees who attended are shown in the slides below.



Scan me to see the presentation!