In this issue

Jonathan E. Forman, Christopher M. Timperley, Siqing Sun and Darcy van Eerten

Chemistry and diplomacy

https://doi.org/10.1515/pac-2018-0902
Pure Appl. Chem. 2018; 90(10): 1507–1525

Conference paper: The Chemical Weapons Convention, an international treaty for disarmament and non-proliferation of chemical weapons, is implemented by The Organisation for the Prohibition of Chemical Weapons (OPCW). The role of its Scientific Advisory Board (SAB), to review science and technology to advise disarmament and non-proliferation policymakers and to feed science into the world of international diplomacy, are summarized.

Keywords: Chemical Weapons Convention 2017; chemical weapons; Director-General; disarmament; non-proliferation; Organisation for the Prohibition of Chemical Weapons (OPCW); science advice; science communication; science diplomacy; science policy; Scientific Advisory Board; scientific advisory mechanism; scientific literacy; States Parties.

Jonathan E. Forman, Christopher M. Timperley, Pål Aas, Mohammad Abdollahi, Isel Pascual Alonso, Augustin Baulig, Renate Becker-Arnold, Veronica Borrett, Flerida A. Cariño, Christophe Curty, David Gonzalez, Zrinka Kovarik, Roberto Martínez-Álvarez, Robert Mikulak, Evandro de Souza Nogueria, Ponnadurai Ramasami, Syed K. Raza, Ahmed E. M. Saeed, Koji Takeuchi, Cheng Tang, Ferruccio Trifirò, Francois Mauritz van Straten, Farhat Waqar, Volodymyr Zaitsev, Mongia Saïd Zina, Katarína Grolmusová, Guy Valente, Marlene Payva, Siqing Sun, Amy Yang and Darcy van Eerten

Innovative technologies for chemical security

https://doi.org/10.1515/pac-2018-0908
Pure Appl. Chem. 2018; 90(10): 1527–1557

Conference paper:

The potential uses of innovative tools in the implementation of the Chemical Weapons Convention, described during a workshop attended by 45 scientists from 22 countries, are reported. Sensor development, precision agriculture, mobile and wearable technologies, digital health, autonomous sample collection and analysis, satellite image analysis, and other technologies that enable real-time analysis and decision-making, were explored to extend capability options available to the Organisation for the Prohibition of Chemical Weapons (OPCW) for verification of chemical weapons.

Keywords: Chemical Weapons Convention 2017; chemical weapons; emerging technologies; if plants could talk; innovation; inspector; Organisation for the Prohibition of Chemical Weapons (OPCW); precision agriculture; remote sensing; science diplomacy; sensor; unmanned aerial vehicle (UAV); unmanned ground vehicle (UGV).

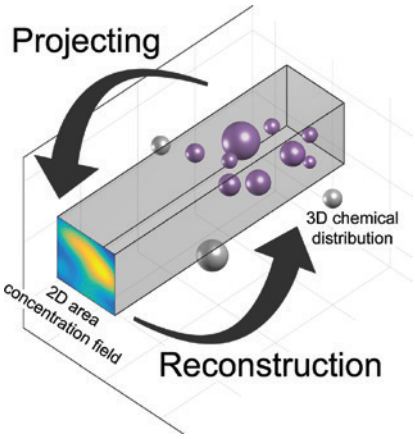
Oscar Björnham, Håkan Grahn and Niklas Brännström

Reconstructing chemical plumes from stand-off detection data of airborne chemicals using atmospheric dispersion models and data fusion

https://doi.org/10.1515/pac-2018-0101
Pure Appl. Chem. 2018; 90(10): 1577–1592

Conference paper: Many detectors provide 2D projections of the true 3D distributions of airborne chemicals. We describe a method of reconstructing the original distribution by incorporating an atmospheric dispersion model and applying data fusion. This generic method is applicable to a wide range of problems.

Keywords: atmospheric dispersion modeling; Chemical Weapons Convention 2017; hazardous substances; source term estimation; stand-off detection.



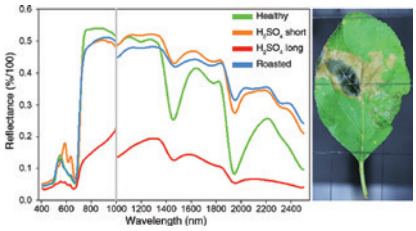
Matheus Thomas Kuska, Jan Behmann and Anne-Katrin Mahlein

Potential of hyperspectral imaging to detect and identify the impact of chemical warfare compounds on plant tissue

https://doi.org/10.1515/pac-2018-0102
Pure Appl. Chem. 2018; 90(10): 1615–1624

Conference paper: The results of the present study underline the high potential of hyperspectral imaging for the detection and characterization of chemical warfare agents.

Keywords: Chemical Weapons Convention 2017; optical sensors; public security; spectral reflectance; stress detection.



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Advice from the Scientific Advisory Board of the Organisation for the Prohibition of Chemical Weapons on isotopically labelled chemicals and stereoisomers in relation to the Chemical Weapons Convention

https://doi.org/10.1515/pac-2018-0803
Pure Appl. Chem. 2018; 90(10): 1647–1670

Conference paper: The Chemical Weapons Convention lists chemicals subject to declaration and verification in a series of schedules. Ambiguities presented by isotopically labelled and stereoisomeric variants of these chemicals in connection with obligations under the Convention were resolved through advice provided by the Scientific Advisory Board of the Organisation for the Prohibition of Chemical Weapons. A change to national licensing influenced by this advice is discussed.

Keywords: Annex on Chemicals; BZ; chemical warfare agent; Chemical Weapons Convention 2017; diastereomer; enantiomer; isotope; isotopically labelled; National Authority; nitrogen mustard; Organisation for the Prohibition of Chemical Weapons (OPCW); organophosphorus nerve agent; sarin; scheduled chemical; science diplomacy; science policy; stereoisomer; sulfur mustard; vesicant.