

IUPAC | CCCE 2021 Virtual • August 13 - 20, 2021

IUPAC | CCCE 2021

Solving Global Challenges with Chemistry



Endorsed by:
INTERNATIONAL UNION OF
PURE AND APPLIED CHEMISTRY

**48th IUPAC World Conference on Chemistry Education &
104th Canadian Chemistry Conference and Exhibition**
Solving Global Challenges with Chemistry

Symposium: Systems Thinking in Chemistry Education. Virtual Conference, 13-20 August 2021.

Strengthening the role and relevance of the chemical sciences for the future of our planet: Systems thinking in chemistry education

Peter G. Mahaffy,^{a*} Thomas A. Holme,^b Stephen A. Matlin,^{c,d} Jaclyn J. Stewart,^e J. Marc Whalen^f

- a. Department of Chemistry, the University of British Columbia, Vancouver, British Columbia V6T 1Z1, Canada
- b. Department of Chemistry, Iowa State University, 2415 Osborn Drive, Ames, IA 50011, USA
- c. Institute of Global Health Innovation, Imperial College London, London SW7 2AZ, UK
- d. International Organization for Chemical Sciences in Development, 61 rue de Bruxelles, B-5000 Namur, Belgium
- e. Department of Chemistry, Dalhousie University, Halifax, Nova Scotia B3H 4R2, Canada
- f. Department of Chemistry and the King's Centre for Visualization in Science, The King's University, Edmonton, Alberta T6B 2H3, Canada

* Corresponding author

Abstract

The material basis of our society and economy underlies considerations of how present and future generations can live within the limits of the natural world. Chemistry, as the science that focuses on understanding the structure and properties of matter, has a central role to play in building a sustainable future for our planet. But achieving that challenging sustainability goal requires concerted blending of chemistry's contributions into a convergence of ideas, approaches, and technologies from other disciplines. And, within chemistry, the fields of education, research, and practice also need to converge for both current and future chemical science professionals to successfully drive change. One promising approach to realize those convergences is systems thinking, a framework that can bring disciplines together in new ways and connect chemistry to the sustainability of earth and societal systems. We will discuss a concrete example of incorporating systems thinking into chemistry education that builds on the chemistry of reactive nitrogen and ammonia, which is a commodity of fundamental importance to many aspects of human activity and to chemical industry. We will also connect this approach to work of a global IUPAC project, "*Systems Thinking in Chemistry for Sustainability: Toward 2030 and Beyond (STCS 2030+)*."

Suggested citation:

P. G. Mahaffy, T. A. Holme, S.A. Matlin, J. J. Stewart, J. M. Whalen, *Strengthening the role and relevance of the chemical sciences for the future of our planet: Systems thinking in chemistry education*. Paper presented at **48th IUPAC World Conference on Chemistry Education / 104th Canadian Chemistry Conference and Exhibition**: Solving Global Challenges with Chemistry. *Symposium: Systems Thinking in Chemistry Education*. Virtual Conference, 13-20 August 2021. Abstract. <http://www.iocd.org/WhatWeDo/publications.shtml>