The National Academies of
SCIENCES • ENGINEERING • MEDICINE

THE CHEMISTRY OF URBAN WILDFIRES:
AN INFORMATION-GATHERING WORKSHOP

JUNE 8, 2021
VIRTUAL (All times in EDT)

10:00 **Opening Remarks and Goals of the Workshop**
David Allen, Committee Chair

I. COMPOSITION OF URBAN MATERIALS AND THEIR COMBUSTION PRODUCTS
Session Chairs: Marilyn Black and Anna Stec

10:10 **The Fuel of Our Homes - from Building Materials to Content**
Birgitte Messerschmidt, National Fire Protection Association

10:35 **Combustion Product Yields: Basic Principles and Examples from Large Fire Tests**
Per Blomqvist, Research Institutes of Sweden

11:00 **Behavior of Flame Retardants and Other Chemicals of Concern in Fires and Their Degradation Processes**
Richard Hull, University of Central Lancashire, United Kingdom

11:25 **Flame Retardants in Building Materials and Consumer Products: Concerns for Exposure**
Heather Stapleton, Duke University

11:50 **Break**

II. EMISSION SOURCES AND POTENTIAL EXPOSURES
Session Chairs: Jeff Burgess and Fernando Rosario-Ortiz

12:30 **Exploring the Complexity of Gas and Particle Phase Organic Chemistry and Indoor Infiltration Rates When Wildfire Smoke Arrives in Highly Populated Regions of California**
Allen Goldstein, University of California Berkeley

12:55 **Residential Indoor Exposure Downwind of Fires**
Shelly Miller, University of Colorado Boulder

1:20 **Soil and Combustion Debris as Specific Emission Source Vectors for Water**
Bruce Macler, U.S. Environmental Protection Agency (retired)

1:45 **Exposure Routes as a Function of Chemical Types and Target Population: Who Are the Sensitive Populations and What Are Their Major Risks?**
John Balmes, University of California San Francisco & University of California Berkeley

2:10 **Break**

III. CHEMICAL PROCESSES

Session Chairs: Barbara Turpin and Fred Dryer

2:20 **Wildland-Urban Interface (WUI) Fires: Perhaps the Greatest Challenge for Fire Safety Science?**
Samuel Manzello, National Institute of Standards and Technology

2:45 **How Do Fire Conditions and Synthetic Materials Affect Near Field Chemistry in Urban Wildfires?**
Eric Guillaume, Efectis

3:10 **How Does Regional Chemistry in Urban Wildfire Plumes Differ from Wildland Fires? Halogens and Plastics**
Steven Brown, National Oceanic and Atmospheric Association

3:35 **How Does Regional Chemistry in Urban Wildfire Plumes Differ from Wildland Fires? Insights from Chemical Transport Modeling**
Christine Wiedinmyer, University of Colorado Boulder

IV. DATA GAPS AND RESEARCH NEEDS

Session Chairs: David Allen and Amara Holder

4:00 **A Panel Discussion on Research Needs and Data Gaps**
Per Blomqvist, Research Institutes of Sweden
Samuel Manzello, National Institute of Standards and Technology
Steven Brown, National Oceanic and Atmospheric Association
Kathleen Navarro, National Institute for Occupational Safety and Health
Peter Lahm, United States Forest Service

Potential Discussion Questions:

- How does the fire behavior in an urban wildfire affect the quantity and composition of emissions from burning structures and their contents?
- How might the composition/chemistry of urban wildfire emissions change once released into the environment?
- What unique factors of urban wildfires may impact acute and chronic health effects of exposed populations? How do the exposures change for urban wildfires compared to vegetative wildfires? What populations may be most vulnerable to these exposures?
- How does the incident response of an urban wildfire differ from a vegetative wildfire? What information would be needed, on what time scales, to enable public health communication/interventions for urban wildfires? How might the communication/interventions change for occupational exposures?

5:00 **Adjourn**