Chemistry and Engineering of Shale Gas and Tight Oil Resource Development  
*A Workshop by the Chemical Sciences Roundtable*  
May 18-19, 2015  
National Academy of Sciences Building  
2101 Constitution Avenue, NW  
Washington, DC 20418  
Lecture Room

**Monday, May 18, 2015**

7:40 – 7:50 Welcome and Introduction, William F. Carroll, co-chair, Chemical Sciences Roundtable

7:50 – 8:00 Welcome and Overview of Related Activities at the NAS, Gregory Symmes, Executive Director, Division of Earth and Life Studies

**Plenary Overview**

8:00 – 8:45 *Is the Oil and Gas Boom Over?* Alan Krupnick, Resources for the Future

**Session 1: Evaluation and Injection of Fluids: What drives the choice of given formulations?**  
Chair: Kenneth Moloy

8:45 – 9:15 *Thinking Constructively About Hydraulic Fracturing Fluid Design in the New Resource Landscape*, Bruce MacKay, Schlumberger

9:15 – 9:45 *Matching Fracturing Fluids with Reservoir Characteristics Improves Completion Fluids Efficacy*, Javad Paktinat, Anadarko Petroleum Corporation

9:45 – 10:00 Break

10:00 – 11:00 Breakout Groups (see Tab 6 for group and room assignments)

11:00 – 11:30 Report Back & Discussion (Lecture Room)

**Session 2: Under the Surface: Chemistry and Chemical Engineering Underground**  
Chair: Robert Kleinberg

11:30 – 12:00 *Hydraulic Fracturing: Perspective, Process and Challenges*, Randy LaFollette, Baker Hughes

12:00 – 12:30 *The Chemistry of Flowback and Produced Waters Associated with Shale Gas Development and Hydraulic Fracturing: Implications for Exploration and Environmental Protection*, Avner Vengosh, Duke University
12:30 – 2:00 Lunch & Breakout Groups (see Tab 6 for group and room assignments)

2:00 – 2:30 Report Back & Discussion (Lecture Room)

**Session 3: Flowback and Resource Recovery**
Chair: Michael Fuller

2:30 – 3:00 *Alternative Water Sourcing for Hydraulic Fracturing*, Danny Reible, Texas Tech University

3:00 – 3:30 *Use of Abandoned Mine Drainage for the Recovery of Barite from Marcellus Shale Produced Water*, Radisav Vidić, University of Pittsburgh

3:30 – 3:45 Break

3:45 – 5:00 Breakout Groups (see Tab 6 for group and room assignments)

5:00 – 5:30 Report Back (Lecture Room)

5:30 – 5:45 Wrap-up and overview of day 2

5:45 Adjourn

**Tuesday, May 19, 2015**

7:50 – 8:00 Recap of day 1 and introduction to day 2

**Session 4: Ecological and Environmental Considerations of the Injected and Produced Materials**
Chair: David Allen

8:00 – 8:30 *Understanding the Hazards & Risks Associated with Chemical Use for Unconventional Oil & Gas Development*, William Stringfellow, University of the Pacific and Lawrence Berkeley National Laboratory

8:30 – 9:00 *Environmental Concerns About Chemical Use in the Oil and Gas Industry*, Briana Mordick, Natural Resources Defense Council

9:00 – 9:30 *An Environmental Suite for Hydraulic Fracturing Operations*, Denise Tuck, Halliburton Energy Services, Inc.

9:30 – 9:45 Break

9:45 – 11:00 Breakout Groups (see Tab 6 for group and room assignments)

11:00 – 11:30 Report Back and Discussion (Lecture Room)

11:30 – 12:00 Closing Discussion

12:00 Adjourn