



California State University of Bakersfield, Department of Chemistry

Making a Fire With a Drop of Water



Standards:

MS-PS1-2. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

MS-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.

MS-PS1-6. Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.

HS-PS1-4. Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.

Introduction:

Normally people would use water to put out a fire, but in this experiment a drop of water will be used to ignite a fire. A drop of water will be placed on a mixture to instantly ignite a blue-green flame and smoke after.

Materials:

- Ammonium Nitrate-14g
- Ammonium Chloride-1.5g
- Zinc Dust-34.5g
- Mortar and Pestle

- Dropper with water

Safety:

- Always have an adult with you to help you during your experiment.
- Always wear eye protection and gloves when doing chemistry experiments
- Conduct this experiment in a well-ventilated area.
- Make sure to not inhale the fumes that are produced.
- Do NOT store mixture anywhere, it will ignite itself.

Procedure:

1. Measure the right amount of each chemical in separate containers using a balance.
2. In the mortar mix the ammonium nitrate and ammonium chloride and grind until no big chunks are left.
3. Go to a fume hood and add the zinc dust (if enough moisture is in the air, it will ignite)
4. Add a drop of water, stand back and enjoy

Data and Observations:

Record your observations in this space

What did you see? Anything you were not expecting? Describe it here.

Questions:

What happens if you mix half of ammonium nitrate and full amount of ammonium chloride with half amount of zinc? Does color change?

If more of the ammonium chloride (catalyst) is added, what happens to the reaction?

References:

Start a Fire with a drop of Water. United Nuclear. <http://www.unitednuclear.com/negx.htm>
(accessed July 31, 2013).