Lesson Plan 2: Recovering Energy from Waste Lab Demonstration

Burning Methane Bubbles

Overview:

Methane gas is bubbled through a soap solution to make bubbles of methane gas. The bubbles are less dense than air and when floated can be ignited by a candle. As preparation you may wish to search the Internet and view one of the many online videos of teachers conducting this lab.

Materials:

- Methane gas – Use the natural gas (methane gas with additives that make the gas smell) commonly available in high school labs to power your Bunsen burner. Make sure your lab does not use LP gas. LP gas is not an alternative for this activity and is not safe to use. An alternative source of methane is CNG (compressed natural gas) that is commonly available from recreational vehicle supply companies. It is distributed in tanks similar to those you use in backyard grills. Methane gas can also be created from burning sodium hydroxide and sodium acetate.
- Prepare ahead of time any safety procedures and equipment such as the use of a fume hood or other ventilation procedures and any fire suppression procedures as required by your school's science safety plan.
- Container of soap and water solution (about 3% soap)
- Candle attached to the end of a meter stick and matches
- Tubing and clamp
- A long-handled wooden or plastic spoon approximately 4" by 4" used to scoop-up bubbles
- Protective eyewear for teacher and all students

Steps:

1. Attach one end of the tubing to the natural gas outlet and place the other end in the bottom of the soap solution.
2. Turn on the gas jet just enough to slowly bubble the gas through your soap solution to form bubbles on top of the solution.
3. Turn off the gas.
4. Gently remove some bubbles from the container of bubbles using the wood or plastic scoop (first dipped in water to maintain the bubbles).
5. Hold the bubbles away from the larger container and move the candle towards the bubbles to ignite them.
6. When all bubbles are gone restart the natural gas to create more bubbles.