CO_2 Enhanced Oil Recovery

EOR

Name: _____

You will need

- 1 mason jar lid with **two** ¼ inch holes
- 1 mason jar lid with **one** ¼ inch holes
- 1 empty water bottle
- 2 24 inch x ¼ inch tubing
- Effervescent tablets (Alka-Seltzer)
- Assorted rocks sand and marbles
- 150ml of vegetable oil or lamp oil
- Silicon sealant
- Safety glasses

WARNING: Safety first! Please wear safety glasses to protect your eyes.

What to do

1. Put one piece of tubing through the lid with two holes. Slide the tube all of the way down into the bottom of one jar.
2. Tape the tubing to the inside of the jar to hold it in place. This jar will serve as your reservoir jar. Place the open end of this tube into the water bottle. The water bottle will serve as your **production bottle.**
3. Insert the second piece of tubing about 5cm through the second hole in the lid for the **reservoir jar.**
4. Insert the other end of this tube about 5cm into the lid with one hole for the other empty mason jar. The jar with one hole on the lid will serve as your CO_2 **injection jar.**
5. Secure the tubing in both lids with sealant. (If time permits, allow the sealant to dry prior to executing the experiment for better results.)
6. Fill the reservoir jar with marbles, rocks, and/or sand. Leave about an inch of open space at the top of the **reservoir jar.**
7. Add oil to the reservoir jar. This represents crude oil stuck within the rocks below ground. Be careful to fill only up to the top of the rocks/marbles/sand.
8. Secure the lid with two holes on the reservoir jar tightly.
9. Holding the lid set-up of the CO_2 injection jar close to the mouth of the jar, quickly drop 6 effervescent tablets into the CO_2 **injection jar.**
10. Immediately secure and tighten the lid of the **CO_2 injection jar.**
11. Be prepared for the **production bottle** to start filling up with recovered oil from the reservoir

Designed by www.need.org/files/curriculum/guides/CarbonCaptureUtilizationandStorage.pdf, and conducted at SMASH Camp 2014 at Richland Community College.

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Questions

What do you think will happen when you add the Alka-Seltzer or effervescent tablets?

What's happening?

This experiment demonstrates (on a very small scale) how CO_2 can be used to push more oil and gas out of reservoirs.

When CO2 is injected into older oil and gas reservoirs it can mix and be absorbed into the oil or gas. The scientific term for this is 'miscible'.

When CO2 mixes with oil in the experiment, it makes the oil expand and flow more easily.

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