**Reservoir in a Jar**

Description:

We tell people that one of the options to releasing CO2 to the atmosphere is to capture it and

store or sequester it underground. What exactly does this mean? Many people imagine a big cave, which seems like it might collapse or blow out. This model lets people see how CO2 could be stored underground in pores in the rock and how it is trapped by reservoir seals and phase

trapping.

Materials and Supplies:

* Clear glass marbles from hobby or garden supply (enough to fill the jar). Several sizes OK.
* 1 quart jar clear with water-tight lid
* Colored lamp oil from hobby or hardware store
* Tap water to fill jar

Setup:

Check jar to make sure the lid can be fastened water-tight. Just like real CO2 storage, we want to

make sure that our demo doesn’t leak. Fill jar with clear glass marbles, don’t overfill. Several

sizes of marbles makes an interesting model. Add about 2-3 oz of colored lamp oil. Fill jar full

with tap water, and put lid on tightly (figure 8).

Presentation:

The jar shows what you would see if you had a microscopic view of CO2 storage site underground. The marbles are sand grains, the water is salt water that fills the spaces. Tip the jar

from vertical to near horizontal and watch the “CO2” move through the holes in the between the

marbles.CO2 floats on top of water, so it tries to move upward. It is held underground by the

seals on the injection zone, like the “CO2” is held in by the sides and walls of the jar. The small

pores are the “micro caves” that would store the CO2 underground. It is also prevented from

escape because it is trapped as small bubbles snap-off from the main body. This is a persistent

characteristic of two phase behavior, and may be important in assuring that CO2 stays

underground. Try jostling the bottle. It is pretty hard to get those phase-trapped bubbles to move!



Figure 8. Using marbles in a jar to help visualize two-phase flow underground.