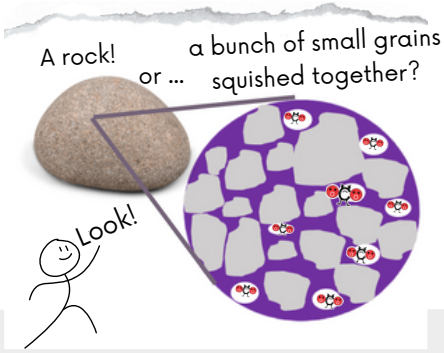
A Drink on the Beach: A Story about Storage Permanence

I worry that the CO_2 injected underground could easily leak out if anyone made a mistake.

It's just there, like an underground cave, and it can come out at any time!



Well, not exactly. CO_2 is stored in microscopic pores between sand grains, not in large empty spaces.

Imagine you spill your drink at the beach. It disappears into the sand within seconds! And you can't scoop it back up.

You can try to recover some of the drink, but most will be lost in the small spaces between the sand.

This is because in small spaces capillary forces make fluids get stuck! And just like the drink, CO_2 stays safely stuck underground.

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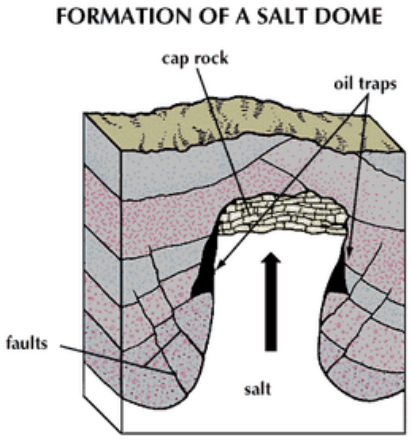

Encyclopædia Britannica, Inc. https://kids.britannica.com/students/assembly/view/53934

Reference 1: Underground Caverns

In some places on the Gulf Coast, large caverns are mined into salt domes, but they are valuable for the storage of hydrocarbon products and <u>are not</u> planned to be used for CO_2 storage.

Reference 2: Pores

Small holes between sand grains typically measure in the micrometer range. Many geologic formations in the Gulf Coast possess high porosity values that can reach upwards of 30-40%, making the region desirable for geologic storage.

Dr. Keith Hayward, USGS. https://www.usgs.gov/media/images/narrower-tube-openings-allow-capillary-action-pull-water-higher

← Different sized tubes impact the movement of fluids.

Reference 3: Capillary Forces

Fluids like to stick to surfaces, and it becomes more or less sticky depending on the material and size of the material. If you are a petroleum engineer, you can calculate exactly how much of the fluid is trapped between grains under different conditions.