

Abstract

Accumulation of atmospheric Carbon Dioxide is allegedly responsible for some aspects of climate change. Carbon traps energy from the sun, which raises overall planetary temperatures, and ultimately has effects on the life forms inhabiting the earth. The environmental effects expected due to rises in temperature have been modeled by scientists on a timeline, which is based on predictions of atmospheric levels of carbon dioxide over time. Some of these predictions are as follows; Rising sea levels, massive deaths from heat strokes during dry seasons, crop death, water shortages, drastically intensified storms, species extinction. Scientists have been sailing across the Atlantic in a bid to track down sand from the Sahara Desert. The team is trying to find out how the dust is affecting marine biology and, in turn, the ocean's ability to soak up the greenhouse gas carbon dioxide. The researchers encountered two large sand storms during their cruise and recorded footage of their dust-drenched experience for the BBC News website. They followed the sand with the help of satellite images and wind forecasts. The main goal of this project is to study the effect of different types of sand in CO₂ absorption by water. This was assessed using a gasoline-fumehood method where carbon dioxide was bubbled into sealed tubes containing a constant amount of water and different amount of sand. The general trend observed in this experiments is that sand increase the water ability to absorb CO₂.

Methods

- Six tubes, one with no sand (control), and five with increasing amounts of sand were prepared.
- 30 ml of distilled water was added to each one of the tubes.
- Tubes were sealed with septum rubber stoppers.
- Tubes were shaken and left on the bench for the sand to settle down for five minutes.



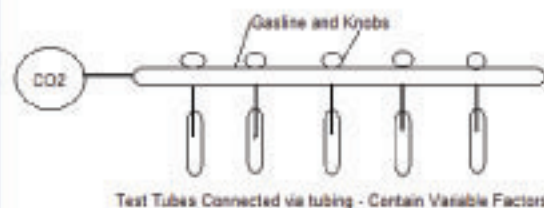
Methods

- Tubes were placed in a wooden rack and located inside a fumehood.
- Inside the fumehood the tubes were connected to a gasoline attached to a carbon dioxide tank.
- Carbon dioxide gas was bubble into the tubes for five minutes. Tubes were detach from the gasoline left on the bench for the CO₂ concentrations to equilibrate (gas phase/liquid phase)
- Carbon dioxide concentration on water was determined by a titration method.

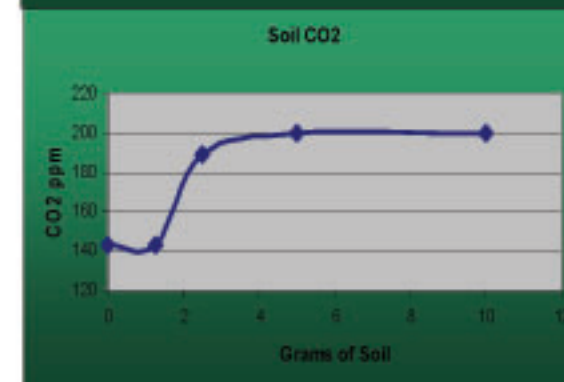
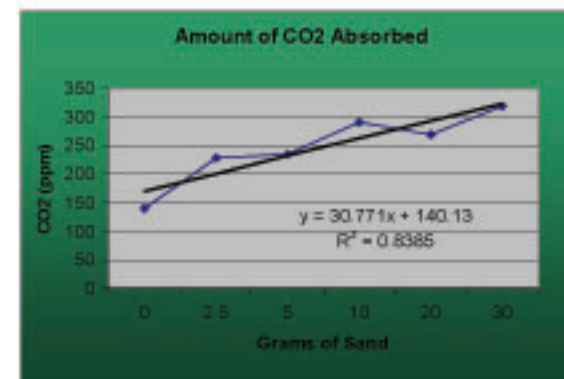
The types of sand used:

- Organic Rich sterilized Potting soil
- Sand Scholar Chemistry
- Sand (Fine)

Sketch and picture of the gasoline-fumehood method



Results



Conclusions & Future Directions

- As the amount of sand Type 1 in a sample increases, the amount of absorbed carbon dioxide in the water sample also increases.
- It is possible that extreme sand storms seen in recent years (e.g., Sahara Sand Storms in 2008 BBC Article) may reduce airborne CO₂ by helping sea water trap it, thus potentially delaying climate change predictions that did not take this variable into account.
- The soil tested showed a similar relationship to CO₂ absorption, up to an asymptote.
- Future studies will evaluate different sand types as well as salt water rather than fresh.