

DESALINATION

Question: How to keep the desalination process simple and less expensive without polluting ground water?

Hypothesis: If we built several layers of sea mud walls on the ocean shore, and allow the sea water to pass through these mud walls, it becomes a filter. Sea Mud is the least expensive material and is available in abundance. When sea water passes through these mud filters the salt will be left behind in the ocean, and the water that comes through the other side of the mud filter will be drastically reduced in salt level. This water can be taken through pipes to existing filtration plants for fresh water processing.

Materials required:

1. Funnel Stand -1
2. Glass funnels – 3
3. Beaker – 1
4. Sea mud – 3 cups
5. Cloth – 3 circular pieces
6. Brita Water Filter -1
7. Salt test strips – 2
8. Table Salt – ½ cup
9. Water – 1 gallon
10. Mug or jar - 1

Note: To simulate sea water, the correct measurement is about half cup table salt for every one gallon of water.

Procedure:

1. Attach the 3 glass funnels to the stand, as shown in the picture
2. Place the cloth in the funnels, so that the sea mud doesn't fall through the funnels



3. Add one cup sea mud to each funnel



4. Fill a gallon of water in a jar, and add ½ cup table salt to it and stir until salt dissolves



5. Test the water in the jar with the salt test trip and note the result

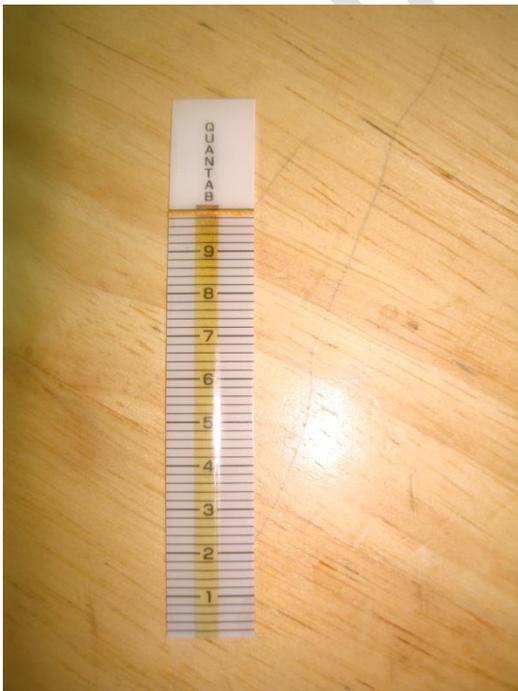


6. Place an empty beaker at the end of the lowest funnel.
7. Pour the salt water slowly in the top funnel.
8. The water drips through all three funnels and is collected at the bottom in a beaker
9. Test the water collected in the beaker with the salt test trip and note the result
10. Pour the water collected in the Brita Filter. The water that comes out, is now fresh, clean, and safe for drinking.



Results:

- Initial test for salt content in the jar of water using the test strip before running it through the mud filters.



Reading: 10

This reading shows that the Sodium Chloride content is about 9000 ppm mg/L

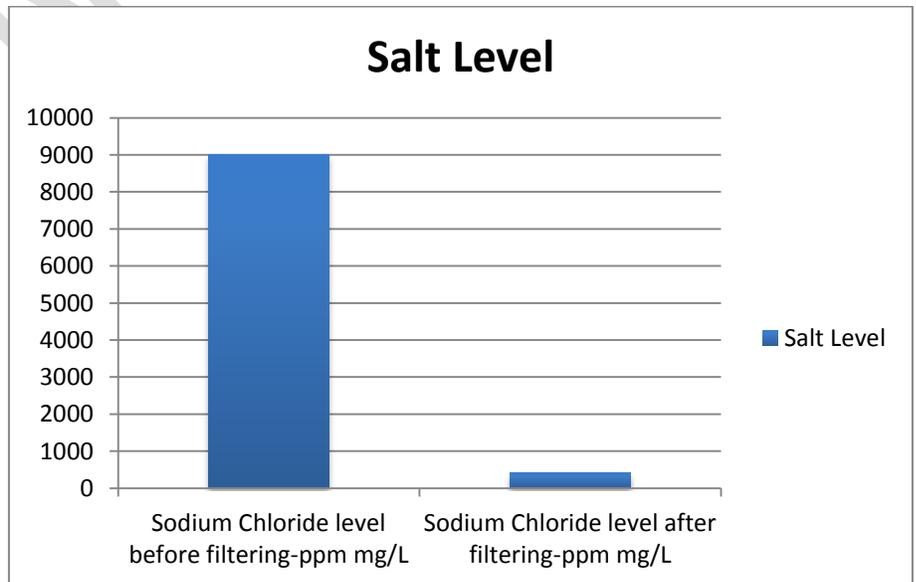
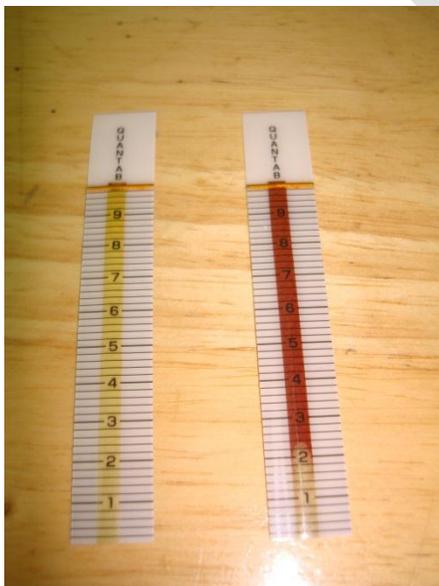
- Test the water in the beaker that is collected after it passes through the three funnels (mud filters). Here is the test strip result after the salt water comes through the mud filters



Reading: 2

This reading shows that the Sodium Chloride content is about 410 ppm mg/L

The graph and picture below shows the salt level reduction by comparing the before and after values:



Conclusion:

The procedure explained in this experiment is simple and very effective. The results clearly show that using three layers of sea mud filters reduces the salt level drastically. Using this method of desalination at the ocean shore, we would avoid bringing sea water into the land and the brine is left behind in the ocean, which would prevent groundwater pollution. The material used, sea mud is available in abundance and does not cost a lot of money to build these mud filters.

The current desalination plants are very complicated, expensive, and are unable to utilize the existing fresh water filtration plants. Since we are filtering most of the salt on the shore of the ocean before it goes through further white water filtration processes, it enables us to use the existing fresh water filtration plants instead of building new expensive plants. In this experiment this is demonstrated by using the Brita water filter after the salt water was filtered through the mud filters.

This experiment has clearly proved that desalination can be achieved in a cost effective way, utilize the existing infrastructures, without polluting ground water.