**Separation of a Mixture Lab**

**Purpose:** The purpose of this lab is to use laboratory procedures to separate a common mixture based on its distinguishing properties.

**Materials:**

* 20 g mixture of salt, pepper, sand
* Electronic scale
* Funnel
* Filter paper – 2 sheets
* Scoopula
* Glass stirring rod
* Weigh boat
* Striker
* Tongs
* Rinse bottle
* 3 beakers
* Ring stand - 2
* Bunsen burner and hose
* Evaporating dish
* Wire gauze
* Clay triangle

**Procedure:**

1. Use a scoopula and weigh boat to measure 20 g of the mixture and add it to the beaker.
2. Add up to 50mL of water to the beaker containing the mixture. (Adding too much water will make it take longer to evaporate later.)
3. Use a glass stirring rod to stir the mixture until the salt dissolves.
4. Let the mixture settle until you see the layers separate. (The sand should settle to the bottom of the beaker, the pepper should float, and the salt should be suspended in the water solution.)
5. Set up your funnel system supported by the ring stand. (Use the clay triangle if needed.) Place a clean beaker under the funnel so it catches the solution that passes through.
6. Fold your filter paper into quadrants as instructed, and separate one of the folds (one fold on one side and three folds on the opposite) and place into the funnel. Cut off any excess filter paper beyond the edges of the funnel. **Measure the initial mass of the filter paper and record in your data.** Label the filter paper with your initials and “pepper”.
7. Return the filter paper to the funnel. Carefully wet the filter paper using the rinse bottle so it adheres to the funnel. Pour out this excess water into the sink before continuing.
8. Decant (pour carefully) the liquid containing the pepper and salt off the top of the beaker into the funnel. Be careful to not disturb the sand, and leave it at the bottom of the beaker. (The sand should remain and will be filtered in the next step.)
9. Use the rinse beaker to rinse the filter paper making sure all salt has passed through the filter. The pepper should remain on the filter paper and can be set to the side to dry.
10. When dry, **measure the mass of the filter paper containing pepper and record in data. Find the final mass of the remaining pepper.**
11. The liquid solution that traveled through the funnel should still contain suspended salt particles and will be evaporated later.
12. **Take the initial mass of the evaporating dish and record in your data.**
13. Use the second ring stand to evaporate the water from the solution. Place a clay triangle on the ring stand and the evaporating dish on top of the wire gauze.
14. Place the Bunsen burner under the ring stand and gently connect the hose to the gas jet.
15. Use the striker to light the Bunsen burner and adjust the ring stand so the flame is lightly heating the evaporating dish.
16. Gently pour the water-salt solution into the evaporating dish so it is one-half to two-thirds full. Not all of the water will fit into the evaporating dish at once. Wait a few minutes and refill the dish until there is no water solution left.
17. Repeat steps 6-15 to filter the sand. Be sure to measure the initial mass of the filter paper and label it with your initials and “sand” before filtering. You’ll need to add just enough water using your rinse bottle to the beaker containing sand to allow it to flow. The filtered water will need to be poured into the evaporating dish and heated to recover any remaining salt after the water is evaporated.
18. When dry, **measure the mass of the filter paper containing sand and record in data. Find the final mass of sand alone and record in your data.**
19. When the water is evaporated, turn off the flame and allow the evaporating dish to cool. Then **measure the mass of the evaporating dish with salt and record in data. Find the final mass of the remaining salt and record in data.**
20. **Add together the total mass of the three items remaining; salt, pepper, and sand. Compare your results with the initial mass of the mixture and record in data.**
21. Properly dispose of the remaining materials. Do NOT pour anything down the sink drain!
22. Clean and return all equipment to its appropriate place.

**Data:** Record all notes, data, and observations as you proceed through this laboratory experiment. You must record at least five general observations while completing the lab.

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| --- | --- | --- |
| Filter paper initial mass (g) | Filter paper initial (g) | Evaporating dish initial (g) |
| Filter paper + pepper (g) | Filter paper + sand (g) | Evaporating dish + salt (g) |
| Pepper (g) | Sand (g) | Salt (g)  |

Initial mass of mixture:

Final mass of mixture:

**Analysis:**

A well thought out evaluation of data collected. Identify all trends or outliers in the data. Did you achieve the results expected? Reflect upon the experiment and identify any possible errors or suggestions for improvement in the future. Analysis needs to be in essay format using complete sentences with appropriate grammar and punctuation.