**Lab: Separating a Mixture**

**Purpose:** To use physical properties to separate a mixture of salt, sand and rocks.

**Research:** Mixtures contain substances that are mixed together, but not chemically bonded. They are usually easy to separate into the parts that make them up because each part retains its own physical properties in the mixture. Physical properties that can be used to separate the parts of a mixture include, but are not limited to, size (large pieces can be picked out,) ability to dissolve in water (if one substance dissolves and the others do not,) magnetism, boiling point (temperature at which a substance will boil,) and density.

Use the information here and your own knowledge of the properties of sand, salt and rocks to list the properties of each that could be used to separate them from each other.

|  |  |
| --- | --- |
| Part of Mixture | Properties |
| Size  | Dissolves in Water |
| Salt |  |  |
| Sand |  |  |
| Rocks |  |  |

**Filtration** – Pour a water mixture through paper in a funnel. The paper will catch the parts of a mixture that do not dissolve in water. The water and substances that dissolve in water will flow throw into the beaker below the funnel.

**Crystallization** – Decrease or remove the water from a mixture to cause a solid to appear.

**Procedure**

1. Measure the mass of your mixture and it’s container (paper cup.) Record
2. Pour your mixture into a 250mL beaker.
3. Measure the mass of your mixture’s container (the paper cup.) Record
4. Subtract the mass of the container (paper cup) from the mass of your mixture with the container to get the mass of your mixture. Record
5. Examine your mixture.
6. Measure the mass of the weigh boat (soon to be the rock’s container.) Record
7. Rocks have the property of large size. Use this property to remove the rocks by picking them out of the mixture and putting them in the weigh boat.
8. Measure the mass of the rocks and their container (the weigh boat.)
9. Subtract the mass of the weigh boat (the rock’s container) from the mass of the rocks with the container to get the mass of the rocks. Record
10. The salt in the sand is soluble in water and the sand is not.
11. Use this property to separate these substances from each other.
12. Put the salt/sand mixture in a 250mL beaker and add 100 mL warm water. Stir
13. Obtain a piece of filter paper. Write your name on it in pencil.
14. Measure the mass of the paper. Record
15. Fold and place it in a funnel as shown by your teacher
16. Place the funnel in the ring stand with a beaker underneath.
17. Pour your salt/sand/water mixture through the funnel.
18. Rinse the beaker with additional water to remove all the mixture from the beaker.
19. Rinse the sand in the funnel with additional water to dissolve any remaining salt.
20. After all the water has drained through, remove the filter paper from the funnel and allow to dry overnight.
21. Place the beaker with the salt water on a hot plate and allow to boil down but not dry.
22. Write your name on a Styrofoam cup, measure it’s mass and record under container for the salt.
23. Pour your salt water into the Styrofoam cup to dry overnight.
24. Next DAY: Measure the mass of the dried sand/filter paper.
25. Subtract the mass of the filter paper from the dried sand/filter paper mass to get the mass of just the sand.
26. Measure the mass of the cup and salt.
27. Subtract the mass of the Styrofoam cup from the cup/salt mass to get the mass of the salt.

**Data**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Substance | Mass, g of substance in its container | Mass, g container | Mass, gSubstance | % of Mixture |
| Mixture |  |  |  |  |
| Rocks |  |  |  |  |
| Dried Sand |  |  |  |  |
| Salt |  |  |  |  |

Pie Graph

**Analysis and Conclusion**

1. Looking at your pie graph, what was the largest percent of your mixture?
2. What property of the rocks did you use to separate them from the mixture?
3. Why did you add water to the mixture?
4. What was the property of the sand that kept it in the filter paper?
5. What went into the beaker below the funnel?
6. Why was it necessary to dry the filter paper overnight?
7. How was the salt separated from the water?