Student Worksheet or Guide

The Bigger the Better - Not always True - Exploring Size Effect on Chemical Reaction Times

Materials

3 - 100 mL graduated cylinders
1 L soda water
5 - 10 g (approx) each of rock salt, sea salt, and table salt
Timer or stopwatch
Weigh dishes or similar to hold salts

Make a Prediction
Does molecular size affect the rate of rate of change? ______________

Conduct an Experiment

1. Pour 75 mL of soda water in each cylinder. Label the cylinders as rock, sea, and table.
2. Simultaneously place the appropriate salts in each cylinder.
3. Observe the reaction times of each. Record the time it takes for each salt to dissolve in the soda water on the table below.
Record your Observations

<table>
<thead>
<tr>
<th>Rock</th>
<th>Sea</th>
<th>Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of soda water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amount of salt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reaction time</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Analyze the Results

1. Did you observe what you predicted? Explain -
   
   ______________________________________________________

   If not, how did your observation differ from your prediction?
   
   ______________________________________________________
   ______________________________________________________
   ______________________________________________________

2. Would it be important to have a control group? Which of the salts would you use as a control group? Why?
   
   ______________________________________________________
   ______________________________________________________
   ______________________________________________________

3. Do your observations leave you with any more questions? Do they enable you to make more predictions? If so, what are they?
   
   ______________________________________________________
   ______________________________________________________
   ______________________________________________________

4. How do you think this activity would have gone if you had salts that were “nano” in size i.e., 10^{-9}.
Draw Conclusions

5. If you were to take Alka Seltzer and water in film canisters or pill bottles to make "rockets" would it make a difference if you used the whole Alka Seltzer tablet or if you crushed it?