Watch the Baby! Superabsorbent Polymers (SAPs)

Purpose
In this activity, you will explore the molecular structure and properties of superabsorbent polymers!

Think About It
1) What observations did you make with the water and the cup?
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

2) What inferences can you make from your observations?
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__________________________________________________________________
__________________________________________________________________

Activity
3) What variable is your group going to be testing?
__________________________________________________________________

4) What is your independent variable? What is your dependent variable?
__________________________________________________________________

5) What controls are you going to maintain?
__________________________________________________________________
__________________________________________________________________

5) What does SAP stand for?
__________________________________________________________________

6) Below, list the materials that you will use. Make sure to include amounts!

Materials
- Four plastic cups
- One marker (to label the cups)
- Balance
- Graduated cylinder
• Teaspoon/scoopula
• Goggles
• Gloves
• ___________________
• ___________________
• ___________________
• ___________________
• ___________________
• ___________________

Procedure
Write out the procedure you will follow. **Make sure you get your procedure checked by your teacher before you begin to test!**

1.

2.

3.

4.

5.

6.

7.
Data
Use the following data table (or make your own) to record the results of your experiment.

<table>
<thead>
<tr>
<th>Type of SAP</th>
<th>Mass of SAP</th>
<th>Amount and type of liquid added</th>
<th>Mass of SAP and liquid</th>
<th>Mass of SAP and liquid absorbed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50 g</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>50 g</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Analysis**

1) What conclusions can you draw from your results?
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__________________________________________________________________
__________________________________________________________________

2) What makes superabsorbent polymers so hydrophilic?
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__________________________________________________________________
__________________________________________________________________

3) What are other examples of hydrophobic and hydrophilic substances?
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__________________________________________________________________
__________________________________________________________________

4) The Greek term *mono-* means alone, where as the term *poly-* means many. With this in mind, why do you think monomers and polymers are named as such?
   a) Many polymers are in the world, but only one monomer
   b) Monomers link together to make polymers
   c) Polymers link together to make monomers
   d) Monomers are made of many different parts

5) What property of water allows it to be absorbed by superabsorbent polymers?
   a) It is wet
   b) It is a liquid, and solids absorb liquids
   c) Water is a polar molecule, and the superabsorbent polymer is also polar
   d) Water is a polar molecule, and the superabsorbent polymer is nonpolar

6) Which of the following is not a good use of synthetic superabsorbent polymers?
   a) Cleanup of liquid waste spills
   b) Coating materials to become super water-resistant
   c) Taking in water better for plants in areas that suffer from drought conditions
   d) Absorbency in diapers
7) Do you think polymers can absorb other liquids aside from water? Why or why not?
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

8) What challenges might be faced when using superabsorbent polymers in cleaning up oil spills? (Hint: think about the experimental results!)
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________