Learning activity 6

Effects of temperature on sugar solubility

**Objective**

To investigate the effects of temperature on sugar solubility

**Principle**

More sugar can be dissolved by increasing the temperature of the sugar solution. A supersaturated solution can be formed when it cools. Large sugar crystals can be formed from a supersaturated sugar solution if it is allowed to cool undisturbed.

**Equipment & materials**

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| --- | --- |
| **Equipment** | **Materials** |
| Scale  Saucepan  Thermometer  Slotted tongs  Wooden spoon  4 String tied to bamboo skewer  4 Polystyrene cups | Granulated sugar 200g x 2 (400g)  Water 75ml x 2 (150ml) |

**Procedure**

1. Dissolve 200g sugar with 75ml water in a saucepan.
2. Stir until sugar dissolves completely.
3. Stop stirring and heat up to the appropriate temperature as follows:
   1. 60oC
   2. 120 oC
4. When the syrup reaches the desired temperature, remove the saucepan from heat.
5. Cool for 5 minutes.
6. Carefully pour the syrup into polystyrene cup (2/3 full).
7. Suspend the string tied with bamboo skewer into the solution.
8. Set for 1-2 hours.
9. Drain off any liquid remaining in the cups when sugar crystals are formed.
10. Rinse sugar crystals with water.
11. Record the shape and size of sugar crystals.

**Results**

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| --- | --- | --- | --- |
| **Sample** | **All sugar dissolve?**  **Y/N** | **Size of sugar crystal** | **Shape of sugar crystal** |
| 60oC |  |  |  |
| 120 oC |  |  |  |

**Questions**

1. Where did the sugar crystal form?
2. How did the changing temperature of sugar syrup affect the crystal formation? Explain.
3. Which product will be affected by the size and shape of sugar crystals during processing?