

Name: _____

Little Miss Muffet Investigation

Background

In this activity, you will mix together and heat milk and vinegar to make curds and whey.

Pre-lab Questions

Define the following words:

1. Chemical reaction:
2. Precipitate:
3. Colloid:
4. Suspension:
5. Whey:
6. Curd:
7. What is a chemical reaction?
8. What are some examples of evidence that a chemical reaction has occurred?
9. What is a precipitate?

Objective

You will investigate how evidence of chemical reactions indicates that new substances with different properties are formed.

Materials

- Milk
- Vinegar
- 2 – Beakers/Containers
- 1 – 50 mL Graduated Cylinder
- 2 – 250 mL Glass Beakers
- Stirring Spoon
- Hot Plate
- Hand Protector
- 1 Coffee Filter
- 1 Rubber Band

Safety

- Always wear safety goggles when handling chemicals in the lab.
- Wash your hands thoroughly before leaving the lab.
- Follow your teacher's instructions for clean-up of your materials.
- Exercise caution when using a heat source. Hot plates should be turned off and unplugged as soon as they are no longer needed.
- When working with acids and bases, if any solution gets on your skin, immediately rinse the area with water.
- Do not consume lab solutions, even if they're otherwise edible products.
- Food in the lab should be considered a chemical not for consumption.

Procedure

1. Record your observations of milk and vinegar in the data section below.
2. Use the graduated cylinder to measure 30 mL of milk and pour it into one of the glass beakers.
3. Use the graduated cylinder to measure 30 mL of vinegar and pour it into the same glass beaker.
4. Turn on the hot plate to a low heat setting.
5. Place the glass beaker onto the hot plate.
6. Gently stir the mixture until the curds begin to separate from the whey. Record observations in the data table.
7. Turn off the hot plate.
8. Using the rubber band, secure the coffee filter to the second glass beaker.
9. Using the silicone hand protector, carefully pour the curds and whey into the coffee filter to separate the curds from the whey.
10. Throw away the coffee filter.
11. Thoroughly rinse the glass beakers, graduated cylinder, and stirring spoon with water.

Data

| | Observations |
|-------------------------------------|--------------|
| Describe the Milk before mixing | |
| Describe the Vinegar before mixing | |
| Describe the mixture during heating | |

Analysis

1. What was forming and falling to the bottom of the beaker during heating? What is the scientific name for it?

2. How are the properties of the original substances (reactants) different than the properties of the resulting products?

3. What this a chemical or physical change? What evidence supports your choice?

Conclusion

For your closing task, you will write a 3-5 sentence summary about the cheese-making process of separating curds from the whey using an acid.