

Can't Judge a Powder – Sylvania Invitational – 12/10/2022

Powder: Baking soda

To score X points, the supporting observations...

- 5 points
 - Observations correctly “answer” question
 - Observations have sufficient detail
 - Ex: “Powder is shiny” < “Powder has “glitter-y shine”
 - Observations are quantitative where possible and provide appropriate units
 - How much powder?
 - How much reagent?
 - How much (change)?
- 4 points
 - Observations lack full quantitative details or appropriate units
- 3 points
 - Observations correctly “answer” question
 - Observations lack quantitative details

OR

 - Max points for an “Observation” that is actually an inference
 - Ex: “there was a reaction...”, “the dissolution was exothermic...” etc.
- 2 points
 - High-quality observation that doesn’t correctly “answer” the question but is related
 - Ex: For an exothermic reaction, “Was the reaction exothermic?” if the students provide good observations but found that temperature decreased.

OR

 - Max points for “write-in” response: students answered question correctly and with sufficient detail
- 1 point
 - Students provided “mid-tier” observations pertaining to the question, but that don’t correctly “answer” the question

OR

 - A write in response that correctly answers the question but not with sufficient detail
- 0 points
 - No response

OR

 - Supporting observation does not pertain to the question

OR

 - Write-in response is wrong or does not pertain to the question

1. White, or something similar to that
2. Too small to be distinguished with naked eye; visible under magnifying glass; much smaller than 1 mm; between 10 and 100 could fit in 1 mm
3. Shape of the powder grains could not be accurately decided under a magnifying glass due to small size; otherwise if large enough to be seen, shape of grains is irregular
4. The powder is not magnetic
5. The powder "sparkles" when tilted, but is otherwise dull, or some similar description
6. The temperature should be somewhat similar to room temperature
7. Signs of a reaction with water that may be observed include bubbling/effervescence, temperature change, etc
8. The powder is soluble in water small concentrations; 150 mg in 1 mL of water is only partially soluble, whereas about 50 mg in 1 mL of water is fully soluble
9. The temperature of the water will go down, indicating an endothermic process
10. Basic; the pH is between 8 and 10
11. Yes; the resulting solution will be weakly conductive
12. Yes; vigorous bubbling/effervescence
13. The pH increases
14. No; resulting solution should be clear, except for a few remaining bubbles
15. No odor should be present
16. Yes: decreased – endothermic
17. Transparent; if powder did not dissolve completely, may appear translucent
18. No significant change in pH should be observed
19. Temperature increases – exothermic
20. No