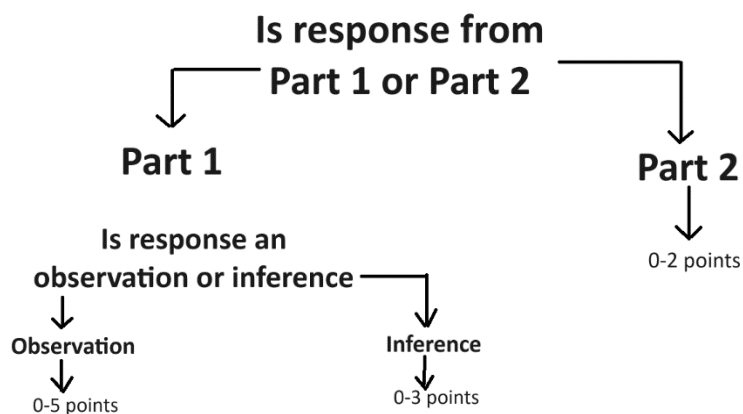


To score X points, the supporting observations...

- 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



Allendale Invitational – 2/24/24

Powder: Hydrated Iron (II) Sulfate – $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$

Extra reagent: Hydrogen peroxide (H_2O_2)

- A. No, grain size varied
- B. Yes, they could be crushed with stirring rod/etc.
- C. No odor (o.k. if weak odor observed)
- D. Pale blue-greenish; jade-colored
- E. More dense; sank when added to water
- F. Yes (X amt. of powder in Y amt. of water); any undissolved powder?
- G. Yes
- H. Between 2-4 (X amt. of powder in Y amt. of water)
- I. Yes (X amt. of powder in Y amt. of HCl); any undissolved powder?
- J. Transparent/clear to yellow-ish
- K. Yes (dark green)
- L. Between 10-12 (X amt. of powder in Y amt. of NaOH)
- M. Exothermic (X amt. of powder in Y amt. of H_2O_2 , start and end temperature)
- N. Orange
- O. No odor (o.k. if weak odor observed)