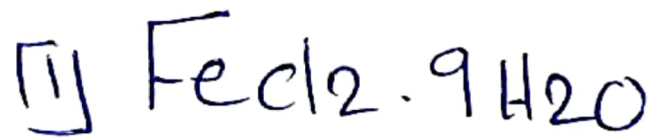


Calculate the mass percent of water of crystallization in the hydrate $\text{FeCl}_2 \cdot 9\text{H}_2\text{O}$. Given the molar mass of $\text{FeCl}_2 = 126.75$ g/mol and $\text{H}_2\text{O} = 18.0$ g/mol.

- 41.5 %
- 29.9 %
- 53.2 %
- 22.1 %
- 56.1 %

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$$M_{\text{FeCl}_2} = 126.75 \text{ g/mol}$$

$$X = \frac{n_{\text{H}_2\text{O}}}{n_{\text{FeCl}_2}} \rightarrow n_{\text{H}_2\text{O}} = 9n_{\text{FeCl}_2} \quad *$$

$$* \text{ mass H}_2\text{O} = 18 * n_{\text{H}_2\text{O}} = 18 * 9 * n_{\text{FeCl}_2}$$

$$* \text{ mass of alum} = 18 * 9 * n_{\text{FeCl}_2} + 126.75 * n_{\text{FeCl}_2}$$

$$\text{H}_2\text{O}\% = \frac{18 * 9 * n_{\text{FeCl}_2}}{n_{\text{FeCl}_2} (18 * 9 + 126.75)} * 100\% = 56.1\%$$

Question 7

Not yet answered

Marked out of 3.0

Flag question

Which of the following statements is correct concerning the formula of a hydrate experiment?

- All hydrated salts can be converted into anhydrous salts by heating.
- Heating the hydrated salt too strongly at the beginning, will lead to a decrease in the calculated value of "x".
- If the dehydration of the hydrate is incomplete, the calculated value of "x" will be lower than the actual value.
- If the mass of hydrated salt and H₂O are 0.59 g and 0.24 g, respectively, then the mass % of water of crystallization is 29 %.
- If 1.1 g of alum is recorded instead of 1.0 g, the calculated value of "x" will be lower than the actual value.

Clear my choice

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Given the following set of data for a given compound (salt $\cdot xH_2O$):

Mass of hydrated salt = 1.45 g.

Mass of water = 0.52 g

Molar mass of anhydrous salt = 258 g/mol

Molar mass of water = 18 g/mol

Calculate water of crystallization x .

- 13
- 10
- 8
- 17
- 11

[Clear my choice](#)

$$[3] \quad X = \frac{n_{H_2O}}{n \text{ anhydrous salt}}$$

$$n_{H_2O} = \frac{0.52}{18} = 0.029$$

$$n. \text{ an. Salt} = \frac{1.45 - 0.52}{258} = 0.0036$$

$$\rightarrow X = \frac{0.029}{0.0036} = 8.06$$

A 20.0 g sample of a hydrate salt was heated until all the water was removed. The sample was then weighed and found to have a mass of 3.2 g. What is the percentage, by mass, of the anhydrous salt in the sample?

- 29.0 %
- 64.0 %
- 16.0 %
- 84.0 %
- 36.0 %

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[4] mass of anhydrous salt = 3.2g
mass of alum = 20.0g

$$\text{an. salt \%} = \frac{3.2}{20.0} \times 100\% = 16\%$$

A sample of $\text{KCr}(\text{SO}_4)_2 \cdot 5\text{H}_2\text{O}$ was heated in a crucible, yielding 2.32 g of the corresponding anhydrous $\text{KCr}(\text{SO}_4)_2$ (molar mass = 283.22 g/mol). If the molar mass of H_2O = 18.0 g/mol, then the mass of the original $\text{KCr}(\text{SO}_4)_2 \cdot 5\text{H}_2\text{O}$ sample is :

- 3.06 g
- 2.73 g
- 2.40 g
- 3.39 g
- 2.08 g

[Clear my choice](#)

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$$[5] \quad X = \frac{n_{H_2O}}{n_{K_2Cr(SO_4)_2}} \Rightarrow 5 = \frac{\text{mass } H_2O}{18 \text{ g/mol}} \cdot \frac{2.32 \text{ g}}{283.22 \text{ g/mol}}$$

$$\Rightarrow \text{mass } H_2O = 0.737 \text{ g}$$

$$\begin{aligned} \text{mass of alum} &= 0.737 + 2.32 \\ &= 3.06 \text{ g} \end{aligned}$$

Which of the following statements is correct concerning the formula of a hydrate experiment?

✓ If 1.1 g of alum is recorded instead of 1.0 g, the calculated value of "x" will be higher than the actual value.

Heating the hydrated salt too strongly at the beginning, will lead to a decrease in the calculated value of "x".

If the dehydration of the hydrate is incomplete, the calculated value of "x" will be higher than the actual value.

If the mass of hydrated salt and H₂O are 0.59 g and 0.24 g, respectively, then the mass % of water of crystallization is 29 %.

All hydrated salts can be converted into anhydrous salts by heating.