Calculate the mass percent of water of crystallization in the hydrate $FeCl_2.9H_2O$. Given the molar mass of $FeCl_2$ =126.75 g/mol and H_2O = 18.0 g/mol.

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

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1] $FeCl_2 \cdot 9H_2O$

$m.m\ FeCl_2 = 126.75\ g/mol$

$$X = \frac{n_{H2O}}{n_{FeCl_2}} \longrightarrow n_{H2O} = 9 n_{FeCl_2} \ *$$

$* mass_{H2O} = 18 * n_{H2O} = 18 * 9 * n_{FeCl_2}$

$* mass\ of\ alum = 18 * 9 * n_{FeCl_2} + 126.75 * n_{FeCl_2}$

$$H2O\% = \frac{18 * 9 * n_{FeCl_2}}{n_{FeCl_2}(18 * 9 + 126.75)} * 100\% = 56.1\%$$

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 H_2O 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.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] $X = \frac{n_{H2O}}{n \text{ anhydrous Salt}}$

$n_{H2O} = \frac{0.52}{18} = 0.029$

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

$\longrightarrow X = \frac{0.029}{0.0036}$

$= 8.06$

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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 = 3.2 g

mass of alum = 20.0 g

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

A sample of $KCr(SO_4)_2.5H_2O$ was heated in a crucible, yielding 2.32 g of the corresponding anhydrous $KCr(SO_4)_2$ (molar mass = 283.22 g/mol). If the molar mass of H_2O = 18.0 g/mol, then the mass of the original $KCr(SO_4)_2.5H_2O$ sample is :

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

Clear my choice

5 $X = \frac{n_{H2O}}{n_{KCr(SO_4)_2}} \Rightarrow 5 = \frac{\frac{\text{mass } H2O}{18 \text{ g/mol}}}{\frac{232 \text{ g}}{283.22 \text{ g/mol}}}$

$\Rightarrow$ mass $H_2O = 0.737$ g

mass of alum $= 0.737 + 2.32$

$= 3.06$ g

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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.