Hydrates Worksheet

1) How is a hydrate different from other chemical compounds?

2) Define the following terms:

- anhydrate

- dehydration

3) Name the following compounds:

a) $FeCl_3 \cdot 6\ H_2O$ _____

b) $CuSO_4 \cdot 5\ H_2O$ _____

4) Write the formulas for the following compounds:

a) barium chloride dihydrate _____

b) magnesium sulfate heptahydrate _____

5) What is the percent composition of water in the compound in problem 4b?

6) If 125 grams of magnesium sulfate heptahydrate is completely dehydrated, how many grams of anhydrous magnesium sulfate will remain?

Hydrates Worksheet Solutions

1) How is a hydrate different from other chemical compounds?
It has water molecules loosely attached to it. These water molecules can typically be removed through heating (a process called "dehydration". Hydrates usually involve ionic compounds with transition metals as the cation.

2) Define the following terms:

- anhydrate
A molecule which has no water molecules attached to it. This term is usually only used when describing chemicals which have specifically had their water molecules removed during heating – in these cases, the word "anhydrate" is added to the name.

- dehydration
The process of removing water from a hydrate, usually through applied heat.

3) Name the following compounds:

a) $FeCl_3 \cdot 6\ H_2O$ **iron (III) chloride hexahydrate**

b) $CuSO_4 \cdot 5\ H_2O$ **copper (II) sulfate pentahydrate**

4) Write the formulas for the following compounds:

a) barium chloride dihydrate **$BaCl_2 \cdot 2\ H_2O$**

b) magnesium sulfate heptahydrate **$MgSO_4 \cdot 7\ H_2O$**

5) What is the percent composition of water in the compound in problem 4b?
126.0 / 246.4 x 100 = 51.14%

6) If 125 grams of magnesium sulfate heptahydrate is completely dehydrated, how many grams of anhydrous magnesium sulfate will remain?

100 – 51.14 = 48.86 % magnesium sulfate

0.4886 x 125 = **61.1 grams**

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