Unit 3 – Chapter 3 Pre-Lab: Water of Hydration **Name _____**

Period _____

1. A student is given a sample of a green nickel sulfate hydrate. She masses the sample in a dry, covered crucible and obtains a mass of 22.326 g for the crucible, cover, and sample. Earlier she had found that the crucible and cover had a mass of 21.244 g. She then heats the crucible to drive off the water of hydration, keeping the crucible at red heat for about 10 minutes with the cover slightly ajar. She then lets the crucible cool and finds it has a lower mass. The crucible, cover, and contents now have a mass of 21.840 g. In the process, the sample was converted to yellow anhydrous $NiSO_4$.

A) What was the mass of the hydrate sample?

_____ g hydrate

B) What is the mass of the anhydrous $NiSO_4$?

_____ g $NiSO_4$

C) How much water was driven off?

_____ g H_2O

D) What is the percentage of water in the hydrate?

(% water = mass of water in sample/mass of hydrate sample X 100%)

_____ % H_2O

E) How many grams of water would there be in 100.0 g hydrate? How many moles?

_____ g H_2O

_____ moles H_2O

F) How many grams of $NiSO_4$ are there in 100.0 g hydrate? How many moles? (What percentage of the hydrate is $NiSO_4$? Convert the mass of $NiSO_4$ to moles. Molar mass of $NiSO_4$ is 154.8 g.)

_____ g $NiSO_4$

_____ moles $NiSO_4$

G) How many moles of water are present per mole $NiSO_4$?

_____ moles H_2O

H) What is the formula of the hydrate?

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