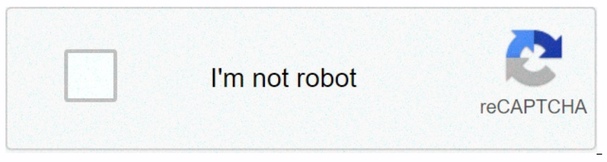

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Formula of a hydrate post lab answers

Background: Forms of ion hydrates Introduction to quantitative analysis: determination of the proportions of subunits in a chemical sample Laboratory tool: Bunsen burner Introduction to forms of matter, an example of ion hydrates Elements: A substance consisting of only one atomic type (e.g. Na, He, O2, P4) Compounds: a substance consisting of more than one type of atom. E.g. Na2SO4 (ion compound; Na2SO4 is a unit of formula) H2O (covalent; exists in separate H2O molecules) Molecules: a substance consisting of more than one atom; atoms are connected to covalent bonds (e.g. O2, P4, C6H12O6, TiCl4). Ion compounds (salts) in which one or more water molecules are bound by the crystalline structure of the salt: CoCl2.6H2O (anhydrous salt)(hydration water) BaCl2.2H2O CaCO3.2 1/2 H2O CaSO4.5H2O Crystalline structure has a unique relationship between water molecules and crystalline structural units. Communication with Ionic Hydrate BaCl2.3H2O procedure (overview) Procedure (details) Each student works individually. Wipe the crucible thoroughly and cover with a clean cloth to remove dirt and other particulate matter. The weight of the crucible (and lid) is then determined +/- 0,01 g. Take about 1 g of the hydrate sample and transfer the sample to the crucible. Samples shall be found on the reagent counter; be sure to write an identification code. Test tubes containing 1 g of hydrate samples are also found on the reagent counter. To quickly get about 1 g of hydrate sample, take the test tube into your locker and get about the same amount of hydrate, from the reagent bottle, as you find one of the standard samples. After receiving the sample, relce the cap quickly into the reagent bottle and tighten firmly. Transfer the hydration sample to the crucible. Determine the mass of the crucible, the hydrate sample and the crucible cover. Use crucible tongs to place the crucible and return the contents to the clay triangle. Cover the crucible hole with the lid. Heat the titi and its contents with a low flame for 5 minutes. Raise the flame temperature and heat to medium flame for 5 min. Increase the flame and heat the sample for another 10 minutes. The crucible must not turn red. (Overheating may cause your sample to break down!) Using crucible tongs, remove the crucible (in the covered area) from the clay triangle and place on a wire marl on a laboratory bench. Allow the crucible to cool to room temperature. (For testing, hold your hand about 1 cm above the crucible.) The weight (and lid) of the crucible and the contents shall then be determined +/- 0,01 g. Heat your sample to a constant mass. Heat the crucible, with a lid as before, for 10 minutes with a hot flame. Allow the crucible to cool to room temperature and weigh again. Crucible and sample masses after first and second shall not exceed 0,03 g. If the difference is greater than 0,03 g, the heating and cooling procedure shall be repeated until the successive heating is below this limit. Then you have warmed your sample to a constant mass. After continuous heating of the crucible and its contents, the contents of the crucible are transferred to the disposal container. If the time allows, you can make another decision. To determine the formula for hydrate Samples 1, 3 and 5 are hydrates of magnesium sulphate, MgSO4.xH2O Samples 2 and 4 are hydrates zinc sulphate, ZnSO4.xH2O To determine the formula you need to specify the following # molS H2O # mols H2O x = _____ ; or y = _____ # mols MgSO4 # mols ZnSO4 To determine moles anhydrous salt and H2O: 1 mol MgSO4 # mols MgSO4 = g MgSO4 x _____ (measured mass ofg MgSO4 anhydrous salt)(1/molar mass) 1 mol H2O # mols H2O = g H2O x _____ (mass ofg H2O water lost)(1/molar mass) Back to the chemical principles lab schedule. Schedule.