Chemical reactions of copper lab answers

Purpose Reactions Procedure Show the variety of substances that an element can be part of: metal --> blue solution --> blue solid --> black solid --> blue solution (again) -- > metal (again). Protection of mass and mes: We must get as much copper back as we started. At each stage there is the same amount of copper: the same number of mems. Experience in standard chemical techniques: filtration and quantitative transfers. Cu(s) --> [Cu(H2O)6]2+(aq) --> Cu(OH)2(s) --> CuO(s) --> [Cu(H2O)6]2+(aq) --> Cu(s) Copper metal dissolves in nitric acid (HNO3). In fact, when the nitrate ion oxids copper metal copper (II) ion, it itself turns into NO2 gas in the process; After copper (II) ion, six water molecules are connected. You should observe that the physical change of copper-colored metal solution disappeared as blue turns ([Cu(H2O)6]2+, hexaaquacopper ion) and developed a brown gas (NO2). Cu (s) + 4 H3O+ (aq) + 2 NO3- (aq) --> [Cu(H2O)6]2+ (aq) + 2 NO2 (g) Hydroxide ion (OH-) copper (II) is connected to the ion stronger than water. As a result, hydroxide ion can take water from copper (II) ion, copper hydroxide, Cu(OH)2, yield a blue precipite. [Cu(H2O)6]2+ (aq) + 2 OH- --> Cu(OH)2 (s) + 6 H2O (l) Heating copper hydroxide produces copper oxide, CuO, a black solid. Cu(OH)2 (s) --> CuO (s) + H2O (l) Copper oxide dissolves in acid and re-connects copper (II) ion to water once again. CuO (s) + 2 H3O+ (aq) + 3 H2O (l) --> [Cu(H2O)6]2+ (aq) Finally, zinc metal aqueous copper (II) drops its ions into metallic copper, while it itself oxidized into zinc (II) ions. We have seen this reaction before in the copper chloride laboratory). [Cu(H2O)6]2+ (aq) + Zn (s) --> Cu (s) + Zn2+ (aq) + 6 H2O (aq) At the same time, Over-existing zinc metal, some, reduces H2.Zn hydronions +2 H3O + (aq) --> Zn2 + (aq) + H2 (g) + 2 H2O (l) I will not go through the procedure step by step in detail, but highlight some safety points and (bold) in some different places in our procedure lab package. Get a piece of copper wire [Cu(H2O)6]2+(aq) and weigh the nearest 0.01 g. Wire parts are close to 0.50 g from 0.35 g. No problem: use the parts we provide. Use the concentrated HNO3 solution about 4-5 ml. Be careful with nitric acid: like other strong acids, if you take it to your skin and clothing will be painful that can damage; unlike other acids, at the same time the affected area will be yellow spots. If some coppers are considered unresolved until the gas production is finished, put the container on the hot plates on the body to accelerate the reaction. Since brown NO2 is gas irritating, it is important to carry out this step on the smoke hood. Then add 10 ml of dictionary water then hold the mixtures inside the hood until by melting copper. [Cu(H2O)6]2+ (aq) cu(OH)2(s) Be careful when using NaOH, as it is a strong base that will sink if it comes into contact with the skin. Add the NaOH solution to the copper solution with drops. Once a blue preciple has formed, periodically test the acidity of the solution by dying your mixing stick in the solution and touching it on the red turnusol paper. Try not to transfer the blue sediation to the turnusol paper: this will cause copper loss and possibly fake blue on the turnusol paper. The solution begins acidic due to nitric acid more than the previous step, so the first OH-added acid goes neutralized; After the acid is neutralized, the next OH-added blue Cu(OH)2 goes into the precipte. Just after this is over OH-hanging idle and just then there is no red turnusol paper will turn blue. We want to make sure that all available copper is converted to Cu(OH)2, so we add OH until the solution turns the turnusol paper blue. Convert Cu(OH)2(s) to CuO(s)) Add water to the reaction mixture obtained in the previous step and add one or two boiling stones. Heat beeher content, but no boil. Boiling black CuO thus makes the filtration step extremely long thin. The heat is all lost to the blue Cu (OH)2 and the container until it is replaced with black CuO. Filter and wash cuo as described in the procedure (Part C). Keep the solid on the filter paper and discard the filtration. Convert CuO(s) to [Cu(H2O)6]2+(aq), untie cuo on filter paper as described in procedure (part D). The solution of sulphuric acid is abrasive and squeals the skin in which it comes into contact. Convert [Cu(H2O)6]2+(aq) cu(s) Add about 1 g Zn to the blue solution obtained in the previous step, and after the solution has lost all its blue color, you may need to add some sulphuric acid to react to the reds. Wash the copper metal three times with dictionary water and transfer it to a evaporative plate (section E) as described in the procedure , and then wash three times with 5 ml portions of isopropanol. Washing with Isopropanol will reduce the time required for the drying step. Dry copper on a container of boiling water, as described in the procedure (E). Weigh the dry copper and record the mass. Calculate the percentage of copper recovered. Let's go back to the Chemical Principles Laboratory Program. Purpose Reactions Procedure Show the variety of substances that an element can be part of: metal --> blue solution --> blue solid --> black solid --> blue solution (again) -- > metal (again). Protection of mass and mes: We must get as much copper back as we started. At each stage there is the same amount of copper: the same number of mems. Experience in standard chemical techniques: filtration and quantitative transfers. 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