

Observations

In method one of the copper experiment, we observed how we went from having a salt solution to a physical piece of copper. When the hexaaqua copper solution was mixed with sodium hydroxide, I noticed that it clumped together in some parts and the solution started to turn blue. Once everything was mixed in, the solution was a cloudy dark blue. Next we took the solution that was basically $\text{Cu}(\text{OH})_2$ and turned it into CuO by deionized water and heating the solution in the beaker. we observed that the solution was slowly turning black and as it progressed, the solution began to separate a little. There was a thin blue layer on top and a clear liquid in middle with some of the blue solution mixing in with the black CuO . So there was a bit of separation happening. After the solution turned completely black with a little bit of blue left because our solution probably had more $\text{Cu}(\text{OH})_2$, we redissolved the solid in sulfuric acid and watched it turn blue again. Once we added zinc to the $\text{Cu}(\text{H}_2\text{O})_6$ solution, we watched it start to bubble immediately, and afterwards, copper metal was left behind.

In method two, we observed a different set of solutions. We dissolved copper (II) sulfate pentahydrate in deionized water and watched it dissolve. It dissolved completely. After that, we added zinc to the previous dissolved solution and observed the zinc turn black and sink to the bottom of the beaker. After the solution, from mixing the zinc, sulfuric acid was added to react to left over zinc. We observed that the solution bubbled a little bit and the leftover zinc turned into copper metal after the reaction from the sulfuric acid.

Data Analysis

My observations were different in each method. Because one method had more going on, the observation was a bit different. We didn't get CuO in the second method because we didn't heat the $\text{Cu}(\text{OH})_2$ solution. While in method two, we got to see zinc turn into solid copper.

- a. Well my observations show what we were trying to get to. We were trying to create copper by mixing different solutions and adding heat in one of the methods. My observations show how we went from a few solutions to eventually having a solid piece of copper.
- b. The events between the molecules that turned zinc into copper after reacting with sulfuric acid along with other solutions to make a blue color.

Discussion

We were trying to create copper using different solutions together that will create bonds to make the solid copper that we were going for. In method one, there were more steps and mixing of solutions to get to the goal of getting copper while the second method had less steps and essentially produced results faster than method one. In regards to which method would be preferred, we would have to look at which method is safer and can also produce results in a considerable amount of time. Method one took more time and required a watch glass to prevent corrosive spray. We observed the reactions in method one and they did require a watch glass for safety. But in method two, it required less time and was safer. The watch glass wasn't really required because there wasn't a corrosive reaction. The solution mixed together and dissolved like we needed it to.

References

Gibson, John. Chemistry 1315 Copper Transformation Lab; University of Oklahoma: Norman, OK (2019)