**AROUND COPPER.**

![C:\Users\Mélinda et Bruno\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\V401XC5G\question_1[1].jpg]()Copper (Cu, red) was the first metal used by human beings.Usually, it is found it in ore\* in which copper atoms are bonded with others atoms. Tenorite (CuO) is one of those ores, it’s a black solid. In deposits, tenorite is associated with copper sulfate which contains copper ions (Cu2+, blue). Copper element exists in different chemical forms. Those mentioned just above and many others. For example, copper hydroxide (Cu(OH)2) is a blue solid.

To begin, list all the copper forms mentioned in the previous text.

In this experiment, we are going to transform copper from a chemical form to another one.

**At your disposal…**

|  |  |
| --- | --- |
| **Equipment** | **Chemical products** |
| -A hotplate-A funnel-A test tube which contain a piece or copper metal.-A dropper. | -Concentrated nitric acid-Sodium hydroxide- Hydrochloric acid | C:\Users\Mélinda et Bruno\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\A8NRRZIE\panneau-attention[1].jpgThose solutions are corrosive. For your security, use it carefully and wear gloves and goggles. |
| -An iron nail\* |

**EXPERIMENTS.**

1. **With nitric acid.**

![C:\Users\Mélinda et Bruno\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\A8NRRZIE\panneau-attention[1].jpg]()Under the extractor hood, pour 2 mL of concentrated nitric acid in the test tube which contains a little piece of copper metal.

![C:\Users\Mélinda et Bruno\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\V401XC5G\question_1[1].jpg]() Be careful with the toxic gases.

 According to the solution colour after the reaction, what does it contain?

1. **With sodium hydroxide.**

![C:\Users\Mélinda et Bruno\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\V401XC5G\question_1[1].jpg]()In the previous test tube, pour carefully, a few millilitres of concentrated sodium hydroxide.

 According to your observations, what chemical species has been produced during the reaction?

1. **With heat.**

![C:\Users\Mélinda et Bruno\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\V401XC5G\question_1[1].jpg]()Gently heat the previous test tube until the solution colour changes.

 According to this experiment result, what is the chemical species produced?

1. **With hydrochloric acid.**

![C:\Users\Mélinda et Bruno\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\V401XC5G\question_1[1].jpg]()When the test tube is cool, pour a little bit of distilled water into it, rinsing the glass wall inside the tube. Then, add the smallest quantity of hydrochloric acid you need to obtain a limpid solution.

 According to the solution colour, what does it contain?

1. **With iron.**

Now, put an iron nail well pickled into the test tube. Wait a minute and take of the nail.

1. ![C:\Users\Mélinda et Bruno\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\V401XC5G\question_1[1].jpg]()What do you observe on the nail?
2. Which chemical species is it?

![C:\Users\Mélinda et Bruno\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\V401XC5G\question_1[1].jpg]()**EXPLOITATION.**

What is the common point between all those chemical species?

**![C:\Users\Mélinda et Bruno\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\V401XC5G\question_1[1].jpg]()CONCLUSION.**

Copy the next diagram and complete it.

**Cu**

 **Nitric acid**

*\*ore: minerai*

*a nail: un clou*