

## 4.5 Alloys



How would you produce an alloy consisting of copper and zinc?



You've probably heard of alloys like brass, bronze, steel, or rose gold. Alloys are solid mixtures of different metals to improve their properties (e.g. the hardness of iron by the addition of chromium, rose gold by the addition of copper).

In the following experiment, we want to show how we can make the alloy brass from copper and zinc. Musical instruments (e.g. saxophone) are produced from brass.



### Set up:

- copper ring/wire/coin
- glass beaker
- **sodium hydroxide**
- zinc powder
- gas burner
- crucible tongs

Work only under supervision by your teacher and wear protective goggles:

1. Dissolve 2 g of NaOH in 20 ml of water in a glass beaker and add two spoons of zinc powder to the solution.
2. Clean a copper coin with citric acid and use tweezers to place it in the solution. Heat the solution on a stand above a tea light for about 5 minutes.
3. Using the tweezers/spoon, remove the copper coin when it shows a grey layer of zinc and rinse it in water.
4. Using the tweezers, briefly pass the copper coin through the blue flame of a gas burner several times until the copper coin looks golden.



**sodium hydroxide**  
– corrosive

**Cool the coin in water before you touch it with your fingers!**



Observing and documenting:

---

---

---

---

---

---

---



- What metals would you mix to produce a solder for low or high melting temperatures?
- What is behind the terms “red gold – white gold – yellow gold”? (copper – silver – platinum)

Cool the coin in water before you touch it with your fingers!



Copper

Zinc

Brass (alloy)



White Gold   Yellow Gold   Red Gold



- Name different examples of alloys in daily life, jewellery, technology.
- How would you determine the amount of copper in a ring made of rose gold?



Technical application and vocational orientation:

---

---

---

## Space for your sketches