Flame tests: Worksheet 8.6

Identifying metal ions using the flame-test procedure

1. a) Explain the purpose of each of these steps.

(i) Using a blue Bunsen burner flame.

(ii) Cleaning the flame test wire before testing the compound.

(iii) Dipping the flame test wire in dilute hydrochloric acid before dipping it into the compound being tested.

(iv) Doing the sodium ion test last, after all the others.

b) There follows a question, a student’s answer and a mark scheme:

*Question:*

Describe how you would use flame tests to distinguish between potassium chloride and copper chloride.

*Answer:*

Use a piece of copper wire and dip it in the hydrochloric acid. Put some potassium chloride on the wire and hold it in a Bunsen flame. Record the colour. Now dip the wire in copper chloride and hold it in the flame. Record the colour. Potassium makes the flame red and copper makes it green.

*Mark scheme*:

* Use flame-test wire or soaked wooden splints (1 mark)
* Clean the wire by dipping it in hydrochloric acid and holding it in a blue Bunsen flame (1 mark)
* Dip the wire into the compound and hold it in a blue Bunsen burner flame (1 mark)
* Clean the wire between the tests (1 mark)
* Potassium ions give a lilac flame; copper ions a green flame (1 mark).

(i) How many marks is the given answer worth?

(ii) Explain why marks were lost.

2. Which of these ions can be identified using a flame test:

(i) sulfate ions; (ii) copper ions; (iii) lithium ions;

(iv) carbonate ions; (v) sodium ions; (vi) calcium ions?