Unit 10 · Inorganic Materials

WORKSHEET

Full marks 46

Name _____ Class _____ Roll no. _____ Date _____ Marks _____ / 46

1 Key words [3]

Match each word in Column A with its description in Column B. Write the letter in the box. One description in Column B is not needed. Each match carries 0.5 mark.

Column A		Column B
1. catalyst	☐	**a.** an oxide that is neither acidic nor basic
2. activation energy	☐	**b.** takes up water from the air and turns damp
3. amphoteric oxide	☐	**c.** an alloy of mercury with another metal
4. deliquescent	☐	**d.** changes the rate of a reaction without being permanently changed
5. saponification	☐	**e.** the energy a collision must have for particles to react
6. amalgam	☐	**f.** boiling fats with sodium hydroxide to make soap
		g. an oxide that reacts with both acids and bases

2 Multiple choice [5]

Choose the correct option for each of the following questions.

i. Which of these is an amphoteric oxide? [1]

a. CaO **b.** SO_2
c. ZnO **d.** CO

ii. When iron reacts with dilute hydrochloric acid, the products are: [1]

a. $FeCl_3$ and H_2 **b.** $FeCl_2$ and H_2
c. $FeCl_2$ and Cl_2 **d.** no reaction

iii. Which property makes nichrome suitable for the heating coil of an electric heater? [1]

a. low resistance and low melting point
b. it is magnetic
c. high resistance, and it doesn't oxidize when red hot
d. it is a good conductor of heat only

iv. Which pair is an interstitial alloy and a substitutional alloy, in that order? [1]

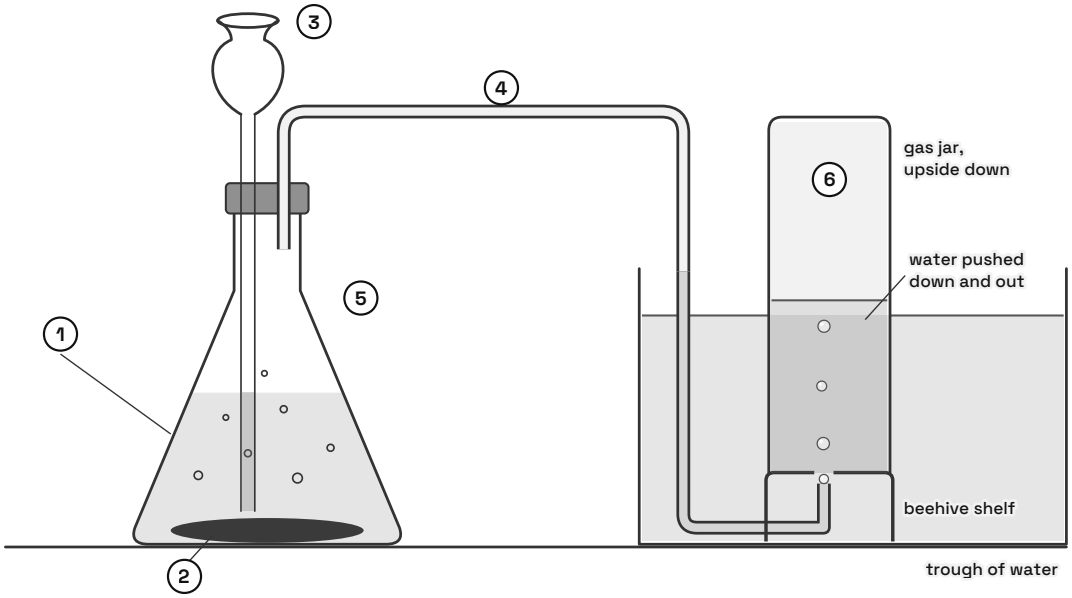
a. brass and steel **b.** steel and brass
c. bronze and brass **d.** solder and bronze

v. A few drops of sodium hydroxide solution are added to a solution, and a blue precipitate forms. The solution contained: [1]

a. iron(III) chloride **b.** copper sulphate
c. sodium chloride **d.** iron(II) sulphate

3 Label the diagram [3]

The diagram shows oxygen being made without heating. Write what belongs at each numbered blank. Each carries 0.5 mark.



1. _____ **2.** _____

3. _____ **4.** _____

5. _____ **6.** _____

4 Very short answers [4]

Write very short answers to the following questions.

a. Which gas is given off when an ammonium salt is warmed with sodium hydroxide? [1]

b. What is the color change of anhydrous copper sulphate when it takes up water? [1]

c. Why is mercury stored in iron flasks? [1]

d. Name the kind of oxide formed when sulphur burns in oxygen. [1]

5 Short answers [8]

Write short answers to the following questions.

a. Give a reason: dry chlorine doesn't bleach a dry flower, but moist chlorine does. [2]

b. Give a reason: sulphur powder is sprinkled over mercury spilled from a broken thermometer. [2]

c. Iron gives $FeCl_2$ with dilute hydrochloric acid, but $FeCl_3$ with chlorine gas. Why the difference? [2]

d. Why does a rise in temperature make a reaction go faster? Give two reasons, in terms of collisions. [2]

6 Long answers [13]

Write long answers to the following questions.

a. Write the balanced equations for the reactions of chlorine with (i) hydrogen, (ii) iron, (iii) cold dilute sodium hydroxide, (iv) slaked lime, (v) potassium iodide. [5]

b. How does dilute hydrochloric acid react with (i) zinc, (ii) sodium carbonate, (iii) copper oxide, (iv) silver nitrate? Write balanced equations and what you would see. **[4]**

c. Why is an alloy usually harder than its main metal? Explain the two ways a second element can fit in, with an example of each. **[4]**

7 Numerical problems [7]

Solve the following problems. Show your working.

a. A gold necklace of 18 carats has a mass of 35 g. Find the mass of pure gold in it. **[2]**

Answer: _____

b. A craftsman in Lalitpur melts 3.9 kg of copper with 1.1 kg of tin to cast a bell. What is the percentage of copper in the alloy? Is it ordinary bronze or bell metal? **[3]**

Answer: _____

c. A spoon of German silver has a mass of 50 g. Taking the alloy as 60% copper, 20% nickel and 20% zinc, find the mass of each metal in the spoon. **[2]**

Answer: _____

8 Think **[3]**

Riya adds 0.5 g of marble powder to 40 mL of dilute hydrochloric acid, and Nabin adds 0.5 g of marble chips to another 40 mL of the same acid. Riya's fizzing stops within a minute; Nabin's goes on for many minutes. Nabin says, "My chips must give more carbon dioxide, since they fizz for longer." Is he right? Explain.

9 Activity: What speeds up a reaction? (not marked)

With your teacher, and wearing goggles. Marble fizzes in hydrochloric acid, giving off carbon dioxide. Use 40 mL of acid and 0.5 g of marble each time. Add the marble to both flasks of a pair at the same moment, and change only one thing in each pair.

Pair	My guess: which is faster?	Which was faster?	Why, in terms of collisions?
dilute acid, half-strength acid (chips)			
warm acid, cold acid (half-strength, chips)			
chips, powder (dilute acid)			

Does any pair give more gas in the end? Why?