

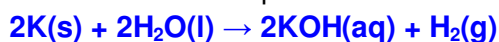
1. Properties of Metals

(a) Complete the following table.

Elements present	Alloy formed
copper and tin	Bronze
iron and carbon	Steel
copper and zinc	Brass

(b) Which reference to the list of metals below, answer the following questions.
magnesium, potassium, calcium, copper, zinc, lead, silver(i) Arrange the metals in order of **decreasing** reactivity with water.**Potassium, calcium, magnesium, zinc, lead, copper, silver**(ii) Which metal **reacts violently** with cold water with a lot of heat produced?**Potassium**

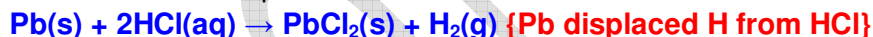
(iii) Write a chemical equation for the above reaction.



(iv) Which metal reacts very slowly with cold water but vigorously with steam?

Magnesium(v) Which metal has **no reaction** with water or steam?**Copper, lead and silver**(vi) Which metal reacts very slowly with **warm** dilute hydrochloric acid?**Lead {lead (II) chloride is insoluble in cold water so you need to warm the acid}**

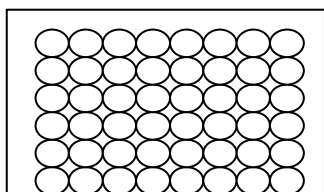
(vii) Write a chemical equation for the above reaction.



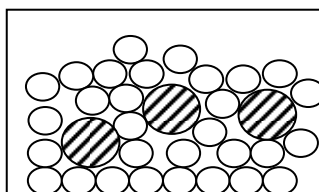
(c) State whether the metals of the following salts will be displaced or not (displaced/ no reaction) when potassium, magnesium and silver are added separately into the salt solutions.

Solution of Metal	sodium nitrate	zinc nitrate	lead nitrate
iron	no reaction	no reaction	displaced
magnesium	no reaction	displaced	displaced
silver	no reaction	no reaction	no reaction

2. (a) In the spaces provided, draw a particulate model of the arrangement of atoms in a pure metal and an alloy.



Pure metal



Alloy

(b) Is steel a pure metal or an alloy?

Alloy {iron + small amt of carbon}

[1]

- (c) Using the diagrams drawn in (a), explain why steel is stronger and harder than aluminium.
An alloy of two metals has atoms of different sizes (1) this disrupts the orderly layers of atoms, making it more difficult for the layers to slide over each other (1)
- (d) State one reason why aluminium is preferred over steel in the making of soft drink cans.
Steel corrodes (rust/oxidise) easily in contact with water and air but not aluminium.
- (e) State one property of aluminium that differentiates it from a non-metal.
Aluminium is a metal and can conduct electricity in solid state but a non-metal cannot.
3. (a) What type of oxide do most metals form? [1]
Basic oxide
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- (b) Calcium, copper, magnesium and iron are metals. [1]
(i) Place these metals in order of reactivity, most reactive first.
Calcium, magnesium, iron, copper
-
- (ii) State how iron and copper each react, if at all, with steam.
iron **red hot iron reacts very slowly with steam**
copper **no reaction** [2]
- (iii) Suggest how calcium reacts with steam. [2]
Very violently
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- (c) Aluminium is high in the reactivity series.
Why do aluminium saucepans **not** react with steam? [2]
Aluminium is protected by a layer of inert aluminium oxide. Hence, aluminium will not come into direct contact with steam.
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N00/P3/Q5

~ The End ~