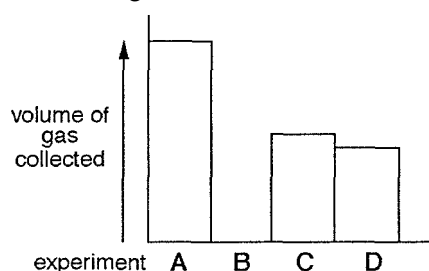


1. In four experiments, A, B, C and D, equal amounts of four different powdered metals were separately added to equal volumes of a dilute acid. The volume of gas collected in the first few seconds is shown in figure below.



The four metals were **magnesium, copper, iron and zinc**. Name the metal used in

- (i) experiment A **magnesium** {react most rapidly with dilute acid}
- (ii) experiment B **copper** {does not react with dilute acid}
- (iii) experiment C **zinc**
- (iv) experiment D **iron** [N02/P3/Q2(b)]

2. Imagine that three metals are transported to Earth by rocket ship from a far distant planet. On the planet the three metals are called beium, ceium and deium. On Earth the three metals are dropped **into water: deium does not react**, but beium and ceium do, liberating a gas which 'pops' when lit. When beium is mixed with dilute sulfuric acid, a solution of beium sulfate is formed. When **ceium is dropped into a solution of beium sulfate, beium is not displaced**.

- (a) (i) Name the gas which 'pops' when lit. **hydrogen** [1]
- (ii) Place beium, ceium and deium in order of reactivity, most reactive first. [1]  
**beium, ceium, deium**

- (iii) What would **you expect to see** if a piece of magnesium was dropped into a solution of deium sulfate? [1]  
**solid deposit of deium formed, magnesium disappeared into solution.**

- (b) Deium could be the same metal as one of Earth's metals.
- (i) Name one of Earth's metals that might be the same as deium. [1]  
**copper / iron / zinc**
- (ii) In the future people on Earth might **need to import this metal** from the far distant planet. Suggest **why this might be necessary**. [1]  
**All metal ores are limited resource. It will be used up one day so it is necessary to import from far distant planet.**

[N03/P3/Q5]

3. (a) Calcium, copper and zinc are three metals.

(i) Table below lists the reaction of these metals with cold water and steam. Put a tick (✓) if a reaction will take place and a cross (X) if a reaction will **not** take place.

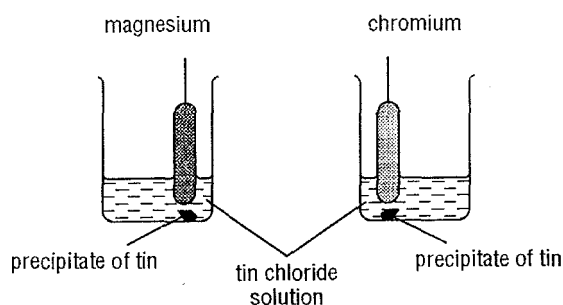
metal	reaction of metal with cold water	reaction of metal with steam
calcium	✓	✓
copper	X	X
zinc	X	✓

[3]

(ii) Place these three metals in order of chemical reactivity, with the most reactive first. [1]  
**calcium, zinc, copper**

[N07/P3/Q3a]

4. These two drawings show the results of putting strips of magnesium and chromium into tin chloride solutions.

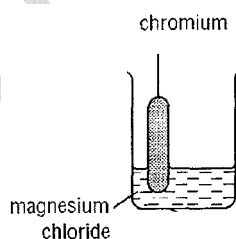


(a) Use these results to decide whether tin is

(i) more or less reactive than magnesium, [1]  
**less reactive {because magnesium can displace tin}**

(ii) more or less reactive than chromium. [1]  
**less reactive {because chromium can displace tin}**

(b) Make a labelled drawing of another, similar experiment which will enable you to decide the order of reactivity of chromium, magnesium and tin. [2]



[N97/P3/Q8]

~ The End ~