

GROUP SEVEN

Group seven are known as the _____.

The ion of the group seven elements are known as _____.

The ion of the group generally has the charge of _____.

In their natural state the elements of group seven are _____.

Halogen _____ Halide _____

Fluorine – _____ Fluoride- _____

Chlorine – _____ Chloride- _____

Iodine - _____ Iodide- _____

Physical properties:

The boiling point down the group.....

Q) Why?

More _____ therefore _____ . Requires
more _____ to overcome the _____.

Element	State at room temp	Colour	Colour of gas
Fluorine			
Chlorine			
Bromine			
Iodine			

Reactivity:

The reactivity of the halogens _____ down the group.

Q) Why?

Increase in _____, therefore an increase in _____ and an increase
in _____ this makes it harder to _____ an electron.

The halogens are all .

Oxidising agent definition:

A species that something else, it itself gets .

The ability of the halogens as an oxidising agent down the group.

Q) Why?

Increase in , therefore an increase in and an increase in this makes it harder to an electron.

Redox reactions of the halogens:

A more halogen will displace a less reactive from its compound.

As an ionic equation:

All the halides in an aqueous solution form .

The halogens dissolved in water form solutions; however, it is difficult to distinguish between them.

Therefore, when these experiments are carried out we use an .
This helps us to see the colour of the at the end of the experiment. Usually the organic solvent is .

Halogen	Colour of the halogen in the organic solvent
Chlorine	
Bromine	
Iodine	

Two layers are seen, an aqueous layer and an organic layer.

Q) Why do we form two layers?

The organic solvent is . When these tests are carried out the is dissolved in the . This is because are non-polar and tend to dissolve more readily into the .

Q) What is seen in the aqueous layer?

The is seen in the aqueous layer. The water is and therefore attracts the halide ions. Halide ions are more readily dissolved in .

Example question:

A solution of potassium bromide is added to an organic solvent and shaken; aqueous chlorine is then added.

a) What would you observe?

b) Write a chemical equation to show what is happening.

c) Write an **ionic** equation for the reaction above

HINT: Remember to remove the spectator ions!

d) What is being oxidised and what is being reduced?

e) What is the stronger oxidising agent? Explain in terms of atomic structure why the one you have chosen is the strongest oxidising agent.

Determining an unknown halide in a solution:

Test: Add _____ and _____

The observations determine the identity of the halide ion.

Halide	Test	Observation

So, what is happening?

The halide ion is forming an _____ . This is a _____ reaction.
. This is known as a _____ reaction.

Q) Write an ionic equation for the above reaction

Further test

Add _____ to the ppt.

_____ will dissolve in _____ to form a colourless solution.

_____ will dissolve in _____ to form a colourless solution.

_____ will not dissolve in _____ or _____ .

Disproportionation reactions of chlorine

Disproportionation reaction definition:

Reaction of chlorine and NaOH

The NaOH is.....

Use:

Q) Complete the ionic equation for the above reaction

Show that the above equation is a redox reaction

Reaction of chlorine and NaOH

The NaOH is.....

The purification of drinking water:

Reaction of chlorine with water:

Use: Added to _____ to kill _____. Disadvantages include that it can be _____ if too much chlorine is added and it can produce carcinogenic _____.

Q) Write the ionic equation for the reaction above:

Commercial uses of the halogens or halogen compounds: