

1) What is the physical property of halogens?

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Atomic radius will increase as you go down the group
Electronegativity will go down as you do down the group
and the melting/boiling point will rise as you go down the group.

2) What is the relative reactivities of halogens?

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Strong oxidising agent so can easily take electrons. They take electrons from the halides and the more dense they are the more they attract.

3) Solubilities of halogens?

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Fluorine react too much with water. Cl, Br and I dissolve but there us no pattern.

4) Order of halogens reactivity

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Chlorine

Bromine

Iodine

5) Colour and state of iodine at RTP (room temperature)

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-Black and solid at RTP

6) Colour and state of chlorine at RTP (room temperature)

6) Colour and state of chlorine at RTP (room temperature)

-Yellow green and gas at RTP

7) Colour and state of bromine at RTP (room temperature)

7) Colour and state of bromine at RTP (room temperature)

-Red-brown and liquid at RTP

8) Colour of chlorine in water solution

8) Colour of chlorine in water solution

Green

9) Colour of bromine in water solution

9) Colour of bromine in water solution

Orange/Brown

10) Colour of iodine in water solution

10) Colour of iodine in water solution

Orange

11) Colour of iodine in hexane

11) Colour of iodine in hexane

Violet/purple

12) Colour of bromine in hexane

12) Colour of bromine in hexane

Orange

13) Colour of chlorine in hexane

13) Colour of chlorine in hexane

Green

14) Colour of silver (I) chloride and precipitate colour

14) Colour of silver (I) chloride and precipitate colour

Cream and partially soluble in ammonia

15) Colour of silver (I) bromide and precipitate colour

15) Colour of silver (I) bromide and precipitate colour

White and soluble in dilute ammonia

16) Colour of silver (I) iodide and precipitate colour

16) Colour of silver (I) iodide and precipitate colour

Pale yellow and insoluble even in concentrated ammonia.

17) colour of chlorine, bromine and iodine with chloride ion.

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There will be no reaction so will stay the colour they were before.

Chlorine stay colourless/pale green

Bromine stay yellow

Iodine stay brown

18) colour of chlorine, bromine and iodine with bromide ion.

18) colour of chlorine, bromine and iodine with bromide ion.

There will be a reaction only for chlorine, the rest will stay normal.

Chlorine will turn yellow

Bromine stay yellow

Iodine stay brown

19) colour of chlorine, bromine and iodine with iodide ion.

19) colour of chlorine, bromine and iodine with iodide ion.

There will be a reaction for both chlorine and bromine but not iodine.

Chlorine will turn brown

Bromine will turn orange

Iodine stay the same

20) Risk of using chlorine

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Can be detectable by smell, can irritate your eyes, skin and respiratory system. If in a bigger concentration it will react in your lungs to form hydrochloric acid which will affect the lungs tissue and drowning.

21) Benefits of using chlorine

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Chlorine are use for water treatment so it will kill the bacteria and other pathogens. It is also use in other household bleach product which kill bacteria on the surface or remove stains from clothing.

22) Risk by transporting chlorine

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To have less risk the tank is in steel and the inside is dry so there is no reaction that can occur. The tank has as well a cylindrical. The loading and unloading is done at the top of the tank.

23) Storing chlorine

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Chlorine can be stored in a cylinder or stored in a scrubber to directly make some bleach to sell. To check if the cylinder has no leaks they will take a piece of cloth soaked with concentrated ammonia and if there is a leak they will see a wide cloud of ammonium chloride made.

24) What titration can be used to calculate the concentration of sodium chlorate?

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Iodine-Thiosulfate titrations

25) How do you make hydrochloric acid as a co-produce?

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Use a chlorination of organic compounds. When you have one then it will undergoes thermal cracking to give chloroethane and hydrogen chloride. The hydrogen chloride can then be converted into hydrochloric acid by passing it through water. A solution of a high concentration can be produced easily as hydrogen chloride is very soluble in water.

26) Hydrogen Halides of Sodium fluoride and sodium chloride.

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Both react with concentrated acid to make hydrogen fluoride and hydrogen chloride gas. In experiment you can see some fume with hydrogen chloride as it meet the moist air and you could have tiny droplet of hydrochloric acid.

27) Hydrogen Halides of Sodium bromide

27) Hydrogen Halides of Sodium bromide

It will first react with concentrated sulfuric acid to make hydrogen bromide. But the bromide is a strong reducing agent making the sulfuric acid to sulfur dioxide. So this means adding sulfuric acid to sodium bromide would not be a good way to produce hydrogen gas because it won't be pure. The gas that will be reacted would be a mixture of hydrogen bromide, sulfur dioxide and bromine vapour. So concentrated phosphoric is used instead.

28) Hydrogen Halides of Sodium Iodide

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React with sulfuric acid to make hydrogen iodide. Bromine is a stronger reducing agent and will reduce the sulfuric more to make hydrogen sulfide gas. So this is not a good idea for getting hydrogen iodine as it will not be pure. The gas that will be make this time is hydrogen iodine and hydrogen sulfide. So concentrated phosphoric is used instead.

29) Similarities and difference of hydrogen halides

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- The thermal stability will go down the group 7. This is because the bond strength decrease between the hydrogen and halogens in the group 7.
- Acidity: In solution very soluble hydrogen halides are very acidic apart from hydrogen fluoride which is even more acidic than the rest.
- All hydrogen halides will react with ammonia to make salt.
- Reaction with sulfuric acid are different with different hydrogen halides as the strength of the halides ions increase as reducing agent. When we compare the reaction of solid halides with sulfuric acid, the hydrogen fluoride and hydrogen chloride do not react. Hydrogen bromide makes sulfur dioxide and hydrogen iodine makes hydrogen sulfide.