

1.

Group V chlorides are covalent molecules. The boiling points of some Group V chlorides are shown.

chloride	boiling point/°C
$\text{NCl}_3$	71
$\text{PCl}_3$	
$\text{AsCl}_3$	130
$\text{SbCl}_3$	283

Explain the trend in boiling points in terms of attractive forces between particles

- Attraction increases
- Between molecules

2. **Why chlorine does not react with aqueous sodium fluoride**

Because chlorine is less reactive than fluorine.

3. **observations that can be made when potassium is added to water**

- Floats / moves
- dissolves / disappears / melts
- bubbles / fizzes / effervesces
- lilac flame

4. **From the first 30 elements of the periodic table, which is the gas with the slowest rate of diffusion at room temperature?**

Chlorine

5. **Of the elements in period 2 of the periodic table, which has the highest rate of diffusion at room temperature?**

Neon

NOTE: although neon has the highest Ar, it is a monatomic molecule, therefore the lightest. It is the same case with question 4. Argon has higher Ar than Cl, but is monoatomic so lighter.

6. **Suggest the appearance of fluorine, chlorine and bromine**

- Fluorine: Pale yellow and gas
- Chlorine: Pale yellow-green and gas
- Bromine: Red-brown and liquid

7. Which of the element in period 3 forms a binary compound with hydrogen that is a strong acid.

Chlorine

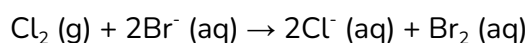
8. Which element in period 3 has an oxidation number of  $-1$  when it forms a compound with hydrogen.

Chlorine

9. Chlorine gas is bubbled into a test-tube containing aqueous potassium bromide. Describe the colour change seen in the test tube.

- From colourless
- To orange

Complete the ionic for this reaction, including state symbols



NOTE that the  $\text{Br}_2$  is aqueous!

NOTE: when asked to state the group number of an element, just state in normal numbers; roman numeral is not required.