1.

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

chloride	boiling point/°C
NCl_3	71
PCl_3	
$AsCl_3$	130
$SbCl_3$	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
   Cl_2 (g) + $2Br^-$ (aq) → $2Cl^-$ (aq) + Br_2 (aq)

   NOTE that the 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.