

A-Level Chemistry

Name: _____ Score: _____

1. At room temperature, the states of chlorine, bromine and iodine are:
 - ☐ gas, liquid, solid
 - ☐ all gases
 - ☐ all solids
 - ☐ liquid, solid, gas
2. A halogen acts as an oxidising agent because it:
 - ☐ gains an electron to form a 1– ion
 - ☐ loses an electron
 - ☐ gives away protons
 - ☐ gains a proton
3. The reducing power of the halide ions increases down the group because:
 - ☐ a larger ion holds its outer electron less tightly, so it is given up more easily
 - ☐ a larger ion holds its electron more tightly
 - ☐ they gain electrons
 - ☐ the nuclear charge falls
4. Chlorine with cold, dilute sodium hydroxide forms:
 - ☐ sodium chloride and sodium chlorate(I)
 - ☐ sodium chloride only
 - ☐ sodium chlorate(V) only
 - ☐ sodium oxide
5. Volatility decreases down Group 17 because:
 - ☐ larger molecules with more electrons have stronger London forces
 - ☐ the molecules get smaller
 - ☐ covalent bonds get stronger
 - ☐ they become ionic
6. The halogens exist as diatomic molecules.
 - ☐ True ☐ False

7. Silver nitrate solution is used to test for _____ ions.

8. In the reaction of chlorine with sodium hydroxide, chlorine is both oxidised and reduced.

☐ True ☐ False

9. The halogens become less reactive down Group 17.

☐ True ☐ False

10. A more reactive halogen will _____ a less reactive one from solution.

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1. **gas, liquid, solid**

Chlorine is a gas, bromine a liquid and iodine a solid — volatility falls down the group.

2. **gains an electron to form a 1– ion**

Halogens gain an electron (so they oxidise other species); this power falls down the group.

3. **a larger ion holds its outer electron less tightly, so it is given up more easily**

Reducing means losing an electron; bigger ions lose theirs more easily, so reducing power rises down the group.

4. **sodium chloride and sodium chlorate(I)**

$\text{Cl}_2 + 2\text{NaOH} \rightarrow \text{NaCl} + \text{NaClO} + \text{H}_2\text{O}$ (chlorate(I)); hot concentrated NaOH gives chlorate(V) instead.

5. **larger molecules with more electrons have stronger London forces**

More electrons give stronger instantaneous/induced dipole (London) forces, raising the boiling point.

6. **True**

They form X_2 molecules: Cl_2 , Br_2 , I_2 .

7. **halide**

Different halides give different coloured precipitates.

8. **True**

That is what makes it a disproportionation reaction.

9. **True**

The outer shell is further from the nucleus, so gaining an electron is harder.

10. **displace**

e.g. chlorine displaces bromine.