

Question 25 (Answer: **A**)

- A halogen displaces a halide only if the halogen is **higher** in Group VII.
- Chlorine is above bromine and above iodine, so it displaces both.
- Iodine is below bromine, so it cannot displace bromide.

Question 24 (Answer: **B**)

- Down Group VII the elements get darker and change from gas to liquid to solid.
- Iodine is the last of the common halogens, so it is a solid.
- It is grey-black with a shiny lustre – its **vapour** is the purple one.

Question 22 (Answer: **C**)

- Atomic number, density and melting point all **increase** down Group VII.
- Reactivity decreases, because a larger atom attracts an extra electron less strongly.
- So chlorine is more reactive than iodine.

Question 23 (Answer: **D**)

- Down Group VII the elements change from gas (F_2 , Cl_2) to liquid (Br_2) to solid (I_2).
- Astatine is already a solid, and tennessine is below it.
- So tennessine is expected to be a solid at room temperature.

Question 24 (Answer: **B**)

- A more reactive halogen displaces a less reactive one from its salt.
- Chlorine is above bromine, so chlorine takes the electrons and bromine is set free.
- It is the **element** chlorine that does the displacing and the **element** bromine that appears.

Question 26 (Answer: **A**)

- Down Group VII the elements get darker and denser, changing from gas to liquid to solid.
- So tennessine would be a dense black solid at room temperature.
- But reactivity **decreases** down the group, so it would be less reactive than iodine.

3(a)	VII
3(b)	6
3(c)(i)	tennessine / Ts / Ts ₂
3(c)(ii)	fluorine / F / F ₂
3(d)	halide(s)
3(e)	4
3(f)	krypton
3(g)(i)	$Cl_2 + 2I^- \rightarrow 2Cl^- + I_2$ M1 Cl^- M2 correct ionic equation
3(g)(ii)	M1 I ⁻ loses e ⁻ M2 Cl ₂ gains e ⁻
3(h)	M1 grey-black M2 solid