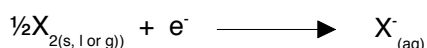


Chemguide – questions

GROUP 7: OXIDISING ABILITY

- Chlorine gas is bubbled through potassium bromide solution.
 - Describe what you would see.
 - Write the ionic equation for the reaction.
 - Explain why this is a redox reaction, stating clearly what is being oxidised and what is being reduced.
 - Explain why the equivalent reaction with fluorine would be more complicated than this.
 - What happens to the oxidising ability of the halogens as you go down the group.
- The following table is taken from the Chemguide page, and shows the various enthalpy changes involved in the reaction:



	atomisation energy (kJ mol ⁻¹)	electron affinity (kJ mol ⁻¹)	hydration enthalpy (kJ mol ⁻¹)	overall (kJ mol ⁻¹)
F	+79	-328	-506	-755
Cl	+121	-349	-364	-592
Br	+112	-324	-335	-547
I	+107	-295	-293	-481

- Define:
 - atomisation energy;
 - electron affinity;
 - hydration enthalpy.
- Ignoring fluorine for the moment, why do the electron affinities of the other three elements decrease as you go down the group?
- Why is the fluorine value lower (less negative) than you might expect?

Chemguide – questions

- d) Why is the fluorine value also out of line with the general trend in atomisation energy?
- e) Why do the hydration enthalpies of the halogens fall as you go down the group?
- f) Explain how the final column (in red) relates to the oxidising ability of the halogens.
- g) What are the two most important factors in producing the changes in the last column as you go down the group from chlorine to iodine?