

Chemguide – questions

GROUP 1: REACTIONS WITH OXYGEN AND CHLORINE

Be sure to check what you actually need to know. This page may well contain things which aren't on your particular syllabus. It is pointless wasting time trying to do questions on material which you won't be asked in an exam.

- Lithium burns in air to form a mixture of two products. Name them, and write equations to show their formation.
 - What do you think you would see if you burned lithium in chlorine? Name the product and write the equation for the reaction. (You aren't expected to have ever seen lithium burn in chlorine – you should be able to work out what happen.)
- The table shows the main product(s) formed when the Group 1 elements burn in a plentiful supply of oxygen.

	oxide	peroxide	superoxide
lithium	✓		
sodium	✓	✓	
potassium		✓	✓
rubidium			✓
caesium			✓

- Write the formulae for sodium oxide, potassium peroxide and caesium superoxide.
- Draw a simple diagram to show the structure of a peroxide ion.
- Explain why sodium forms a peroxide, but lithium doesn't.
- Use figures from the following table to explain why rubidium forms the superoxide rather than a simple oxide or a peroxide in an excess of oxygen.

	Enthalpy change of formation (kJ / mol of Rb)
Rb ₂ O	-169.5
Rb ₂ O ₂	-236
RbO ₂	-278.7

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3. a) Write the equation for the reaction between sodium oxide and water.
- b) Write the equation for the initial reaction between potassium peroxide and water. If you have answered this correctly, you won't have any gases included in the products, but in practice, you do get a gas evolved, perhaps violently. Explain how this arises.
- c) Write the equation for the initial reaction between rubidium superoxide and water. Ignore any follow-up reaction similar to the one in part (b).
4. Name the products of the reactions between dilute hydrochloric acid and the following oxides. If there might be a further reaction after the initial reaction, explain why, and name any additional products from that.
- a) lithium oxide
- b) sodium peroxide
- c) caesium superoxide