A1 · Recall: ions, and names and formulas · Worked examples and practice

Name: _____ Date: _____

Worked examples

Read these first. There is one for each kind of question in this lesson.

Example 1 · Write an ionic formula

Write the formula of lithium oxide.

1. Find each ion's charge: Li^{+} and O^{2-}.
2. Balance the charges to zero: two 1+ ions cancel one 2− ion.
3. Write the positive ion first, with subscripts: Li_2O.
4. Reduce to the simplest ratio: 2 to 1 is already the simplest.
5. Check: the positive total, 2+, and the negative total, 2−, add to zero.

Answer: The formula is Li_2O.

Example 2 · Name an ionic compound whose metal has two charges

Name $CuCl_2$. Copper's ion charges in the Data Booklet are 2+ and 1+.

1. Sort the compound: copper is a metal, so it is ionic.
2. Use ion names: copper and chloride.
3. Add a Roman numeral: 2 chloride ions make 2−, so the copper ion is 2+.
4. It is not molecular, so no prefixes are used.

Answer: The name is copper(II) chloride.

Example 3 · Name a molecular compound

Name PCl_5.

1. Sort the compound: phosphorus and chlorine are two non-metals, so it is molecular.
2. Name the first element. There is one atom, so it has no prefix: phosphorus.
3. Name the second element with a prefix and the ending -ide: 5 atoms is "penta", so pentachloride.

Answer: The name is phosphorus pentachloride.

Practice

Questions 1 to 4 are easy. Questions 5 to 8 are medium. Questions 9 and 10 are harder.

EASY

1. Sodium is a metal. Its box in the Data Booklet shows 1+. Write the symbol of a sodium ion. Say whether the atom lost or gained an electron.

EASY

2. Oxygen is in group 16. Use the group number to find the charge of an oxide ion.

EASY

3. Write the formula of sodium chloride.

EASY

4. Name $MgCl_2$.

MEDIUM

5. Write the formula of aluminium chloride.

MEDIUM

6. Write the formula of sodium sulfate. Sulfate is SO_4^{2-}.

MEDIUM

7. Name CuBr. Copper's ion charges in the Data Booklet are 2+ and 1+.

MEDIUM

8. Name $SiBr_4$. Then write the formula of dinitrogen trioxide.

HARDER

9. Write the formula of magnesium phosphate. Phosphate is PO_4^{3-}.

HARDER

10. Sort each compound as ionic or molecular, then name it: $CaBr_2$, SCl_2 and FeO. Iron's ion charges in the Data Booklet are 3+ and 2+.