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## Using brackets in chemical formulae

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When you first start out in Chemistry GCSE, it's easy to get confused about when and how to use brackets in chemical formulae. If you sometimes find yourself scratching your head on the topic of brackets, this short blog will help you out...

### Elements and simple compounds

First off, elements and simple compounds never need brackets.

**C** is carbon. **O<sub>2</sub>** is oxygen. **NO<sub>2</sub>** is nitrogen dioxide. **CH<sub>4</sub>** is methane. **Al<sub>2</sub>O<sub>3</sub>** is aluminium oxide. No brackets. Simple!



## Compounds formed from complex ions

Brackets are only needed for compounds formed from **complex ions**. But what is a complex ion? Well, it's ion is made up of more than one element.

The most common examples of complex ions are:

|           |                    |
|-----------|--------------------|
| Hydroxide | $\text{OH}^-$      |
| Sulfate   | $\text{SO}_4^{2-}$ |
| Nitrate   | $\text{NO}_3^-$    |
| Carbonate | $\text{CO}_3^{2-}$ |
| Ammonium  | $\text{NH}_4^+$    |



You're expected to know the formulae of these complex ions (and their charges) for the exam.

If there's only one complex ion, then brackets are not needed

Examples:  $\text{NaOH}$   $\text{MgSO}_4$   $\text{NH}_4$   $\text{NO}_3$   $\text{CaCO}_3$

If there's more than one complex ion in the compound, then brackets are needed

You need to put a bracket around the complex ion to show how many of those whole complex ions there are in the compound.

Examples:  $\text{Mg}(\text{OH})_2$   $\text{Al}_2(\text{SO}_4)_3$   $(\text{NH}_4)_2\text{SO}_4$

If you're not sure how to decide whether there's only one ion in a compound, or two or three, then have a look at our blog [Top tips for writing chemical formulae](#), where you'll learn about balancing the charges of positive and negative ions.

