Prefixes of Molarity

With molarity (as with grams and litre) there are shorthand ways of writing concentrations so as to express fractions of a Molar in a convenient way. For example, 0.00001 M can look messy, and can be confusing. How many 0s were after the decimal point?

It is important that you understand the different ways of writing concentrations that are fractions of a Molar as you may encounter them in the scientific literature, or in the instructions for a lab class or an assessment.

Scientific Notation

This is a fairly common and standard approach, and is often the format that results will be returned by the calculator, that is in the format of:

$$1 \times 10^{-3} \text{ M}$$

which is the same as:

$$0.001 \text{ M}$$

Prefix Notation

Prefix notation effectively replaces the x 10n of scientific notation with a letter. For example:

$$1 \times 10^{-3} \text{ M (or 0.001 M)}$$

Would be written as:

$$1 \text{ mM}$$

It should be noted that these prefixes generally work on multiples of 3 of the power of 10, so 1×10^{-3} M is 1 mM, 1×10^{-6} M is 1 μM, and 1×10^{-9} M is 1 nM.

A full list of these prefix are as follows:

SI Unit Prefixes

Prefix	Symbol	10^n	Prefix	Symbol	10n
yotta	Y	10^{24}	deci	d	10^{-1}
zetta	Z	10^{21}	centi	c	10^{-2}
exa	E	10^{18}	milli	m	10^{-3}
peta	P	10^{15}	micro	µ	10^{-6}
tera	T	10^{12}	nano	n	10^{-9}
giga	G	10^{9}	pico	p	10^{-12}
mega	M	10^{6}	femto	f	10^{-15}
kilo	k	10^{3}	atto	a	10^{-18}
hecto	h	10^{2}	zepto	z	10^{-21}
deca	da	10^{1}	yocto	y	10^{-24}

Handy Hint:

Have a look on your calculator. Can you see a button marked Eng or ENG? If you can, then this button will, when pressed, change a number on the screen from normal to scientific notation. The great thing is it will cause the notation to go to a power of 10 that is a multiple of 3, so it is a great way to move number from, say, 0.001 to 1×10^{-3}, and 0.000001 to 1×10^{-6}.