

## Carbon Dioxide (CO<sub>2</sub>)

### What is it and where does it come from?

It is produced as a by-product of numerous industrial and chemical processes.

It is produced naturally when sugar is fermented to make alcohol (beer).

It can also be found in natural 'wells'.

#### Properties:

Chemical Formula	CO <sub>2</sub>
% in the atmosphere	0.038%
Boiling Point	-78.5°C
Density (Air = 1)	1.53
Molecular Mass	44

Discovered by: Joseph Black (1752)

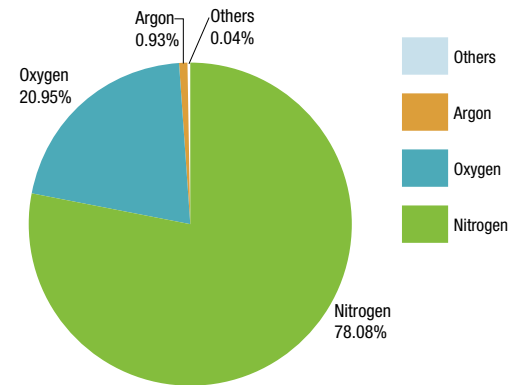
#### Characteristics:

- One volume of carbon dioxide expands to produce 500 volumes of gaseous carbon dioxide
- It is colourless – you can not see it
- It has a slight odour – you can smell it in high concentrations
- It has an acrid taste – you can taste it in high concentrations
- It is not flammable
- It can be toxic in high concentrations

#### Interesting facts about Carbon Dioxide:

- It is heavier than air
- It does not support life
- It does not support combustion and is commonly used in fire extinguishers
- It can form a corrosive acid when combined with moisture
- Carbon dioxide is unique in that it can change from a solid to a gas under normal atmospheric conditions without passing through the liquid phase.
- Carbon dioxide is generated by burning fossil fuels like wood, coal, oil, gas and petrol. It is one of the "greenhouse gases" that causes global warming

#### The air we breath



## *Carbon Dioxide (CO<sub>2</sub>)*

### *What can we use it for?*

CO<sub>2</sub> is used widely in the food industry, and also for welding, oil recovery and water treatment.

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#### ***Food Packaging***

- Carbon dioxide is combined with other gases to replace the oxygen when packing food. This is known as Modified Atmosphere Packaging or MAP.
- It slows down the growth of mould and bacteria, and helps to increase “shelf-life” so that food stays fresher for longer.
- Using carbon dioxide reduces the need to put artificial additives and preservatives into our food. However it is absorbed by moist and fatty foods and too much carbon dioxide can affect the flavour.

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#### ***Drinks Industry***

- Carbon dioxide is used when producing spring water, beer, sparkling wine and soft drinks. The gassy bubbles in a glass of lemonade are carbon dioxide.

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#### ***Water Treatment***

- Carbon dioxide is used to control the alkaline pH level when processing waste water

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#### ***Entertainment***

- Solid carbon dioxide, known as dry ice, is used to produce fog and special effects for films, concerts and pop videos. Carbon dioxide is also used in high pressure cartridges as the propellant for paint-ball guns



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