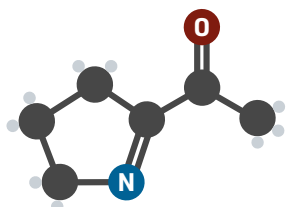


The chemistry of popcorn and what makes it pop

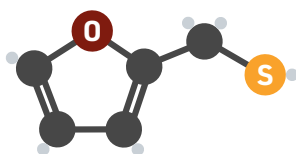
Popcorn flavour and aroma compounds

Many aroma compounds are given off by freshly prepared popcorn. Some of the most significant are 2-acetyl-1-pyrroline (which is a contributor to the roasty, popcorn-like aroma), (*E,E*)-2,4-decadienal (which has a fatty, fried aroma) and 2-furfurylthiol (which in isolation has a roasted coffee-like aroma). A range of other pyrazine, pyridine, and phenol compounds also contribute to flavour and aroma.

KEY: ● Carbon ● Oxygen ● Nitrogen ● Sulfur ● Hydrogen



2-acetyl-1-pyrroline

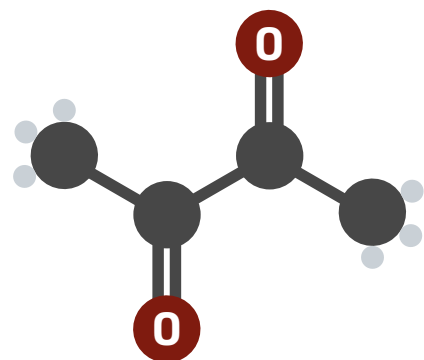


2-furfurylthiol

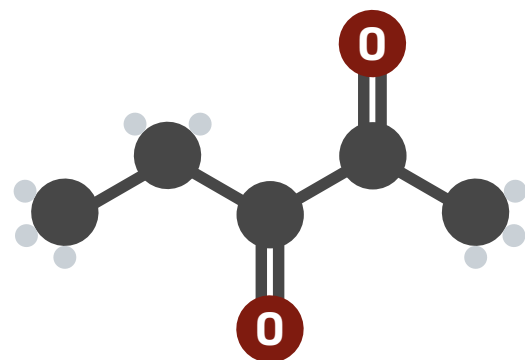


(*E,E*)-2,4-decadienal

Flavourings added to popcorn can also contribute to the aroma. For example, butter-flavoured popcorn can include the compounds 2,3-butanedione (diacetyl) or 2,3-pentanedione. These compounds can cause respiratory problems in workers that inhale them while manufacturing the flavourings – the condition they can cause is known as 'popcorn lung'.



2,3-butanedione



2,3-pentanedione



What makes popcorn pop?

The content of popcorn kernels is about 14% water. When the kernels are heated, this turns into water vapour at water's boiling point. However, it is trapped by the kernel's shell until the pressure builds up enough to crack through. The 'pop' is due to the escape of this pressurised water vapour, rather than the cracking of the kernel's shell. The molten starch bursts through the shell then rapidly cools, giving popcorn its fluffy appearance.

