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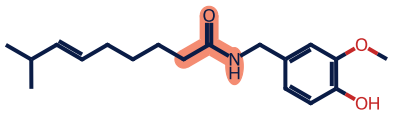
Heat and sting

Six kitchen molecules that burn, sting and make you cry.

1 Heat and sting · 2 Aroma · 3 Taste and tricks

The coloured glow marks the working part of each molecule.

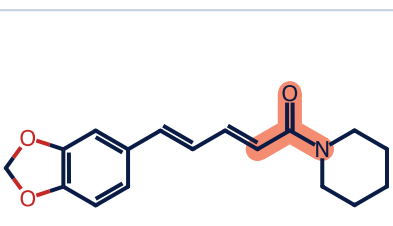
Chem2Cure — Institute for Chemical Research and Therapeutics



মরিচ Chilli — 305.4 g/mol

Capsaicin $C_{18}H_{27}NO_3$ AMIDE

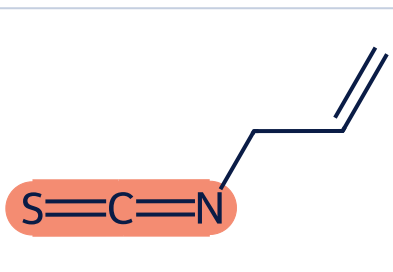
The burn. It switches on the nerve that senses heat, so the mouth feels on fire. Milk helps more than water.



গোলমরিচ Black pepper — 285.3 g/mol

Piperine $C_{17}H_{19}NO_3$ AMIDE

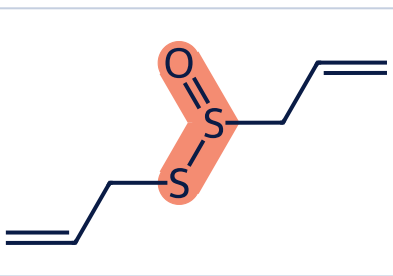
The bite of black pepper. Like capsaicin, it also sets off the nerve that senses heat.



সরিষা Mustard — 99.2 g/mol

Allyl isothiocyanate C_4H_5NS ISOTHIOCYANATE

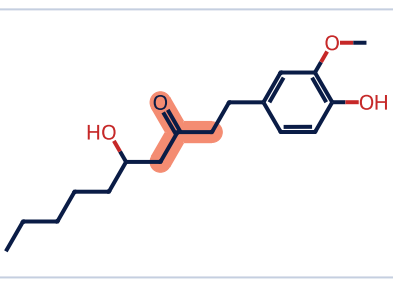
The sharp sting in the nose. It forms only when crushed seeds meet water, so shorshe paste is made fresh.



রসুন Garlic — 162.3 g/mol

Allicin $C_6H_{10}OS_2$ THIOSULFINATE

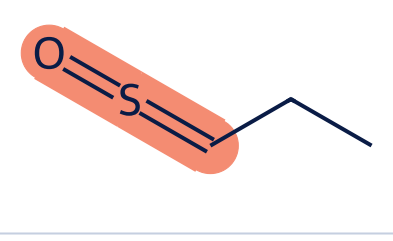
Made only when garlic is crushed, as two separate parts of the clove meet. Its smell fades as it breaks down.



আদা Ginger — 294.4 g/mol

6-Gingerol $C_{17}H_{26}O_4$ KETONE

The warm bite of fresh ginger. Cooking turns some of it into a milder molecule, zingerone.



পেঁয়াজ Onion — 90.1 g/mol

Propanethial S-oxide C_3H_6OS SULFINE

The tear-maker. Cutting an onion releases this gas, and your eyes make tears to wash it away.

GOOD TO KNOW

The heat sensors

Chilli and black pepper switch on TRPV1, a sensor in your nerves that detects heat. Mustard and garlic switch on TRPA1, a sensor for irritants. The 2021 Nobel Prize in Physiology or Medicine honoured the discovery of the body's temperature and touch sensors, and David Julius found TRPV1 using capsaicin.

GOOD TO KNOW

Cool the burn

Capsaicin dissolves in fat, not in water, so a drink of water just spreads it around. Milk and yoghurt work better: the fat dissolves it, and casein, a milk protein, grabs hold of it.

HOW TO READ THIS MENU

The molar mass is the price.

Each dish is a kitchen ingredient, and the molecule behind it. On the right is its molar mass in g/mol, the "price" of one mole of it. The small label names its functional group, and the glow in the drawing shows where it sits.

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