BRAGATO
RESEARCH INSTITUTE
NEW ZEALAND GRAPE AND WINE RESEARCH
RANGAHAU KAREPE, WĀINA O AOTEAROA

World-leading research
from grape to glass

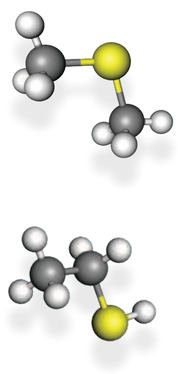
Pinot Noir - the Chemistry

Pinot Noir is the largest red wine variety produced in New Zealand and each wine region has its own unique flavour signatures. These reflect the stories of terroir, ingenuity, legacy and people, which all come together to create these diverse wines.

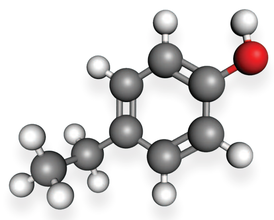
As Pinot Noir ages, it develops distinct aromas and flavours that contribute to its complexity. In all, over **40,000 distinct compounds** have been detected to make up Pinot Noir's chemical matrix, and it is believed many more are yet to be found. While our knowledge of chemistry may never explain the full complexity of Pinot Noir, there are a few important classes of compounds we know about.

VOLATILE SULPHUR COMPOUNDS

Volatile sulphur compounds (VSCs) possess a very low sensory threshold and are associated with strong unpleasant sensory descriptors such as rubber, cooked onions, garlic and cabbage. Together with other wine aroma compounds, however, they are known to add to the overall bouquet.



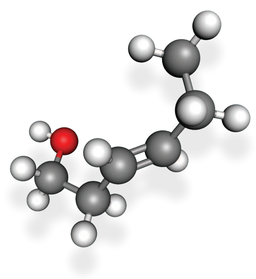
VOLATILE PHENOLS



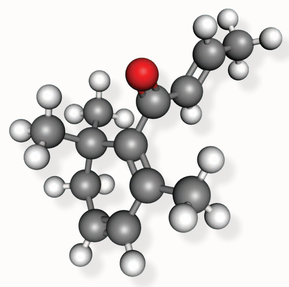
Volatile phenols are aromatic-oil like compounds found in very small traces. Some like eugenol can be pleasant, imparting a spicy clove-like odour, while others like 4-ethylphenol can give barnyard, or mousy aromas, indicative of faults in wine, but interestingly, desired in some Belgian beers.

C6-ALCOHOLS

C6-alcohols, like hexan-1-ol can be found in green plant tissue that make it into the fermentation tank, such as bunch stems. The aroma they impart is described as grassy, or herbaceous.



NORISOPRENOIDS

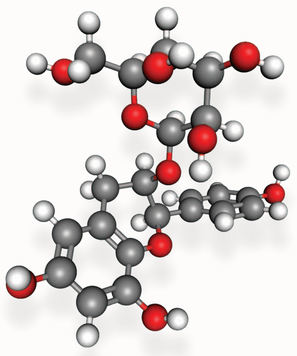


Norisoprenoids like damascenone belong to a family of chemicals known as rose ketones. Despite their very low concentration, they are important contributors to fruity, rose and berry aroma descriptors found in some wines.

TANNINS

Tannins are larger polyphenol structures that are contributors to wine astringency. Smaller polyphenols can also contribute bitter tastes to wine. Tannins change considerably during wine aging.

ANTHOCYANINS



Anthocyanins are the major contributors to the colour of red wine. They belong to a class of polyphenols that are largely water soluble and provide shades of red and purple that vary with wine pH. Foods rich in anthocyanins include blueberries and raspberries.

LEGEND

Compounds are expressed in different stages of the winemaking process:

PREPARATION
COLD MACERATION
FERMENTATION & POST-FERMENTATION MACERATION
MALOLACTIC FERMENTATION AND AGING
BOTTLING