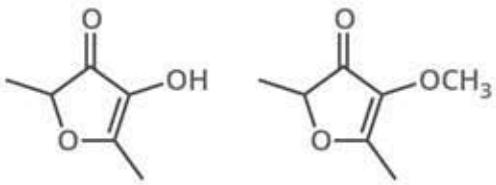
PeriodicGraphics
With Compound Interest

A collaboration between C&EN and Andy Brunning, chemistry educator and author of the popular graphics blog Compound Interest. To see more of Brunning's work, go to compoundchem.com.

THE CHEMISTRY OF STRAWBERRIES

Summer is here, so we're breaking out the strawberries and cream for dessert. Here, we dig into the compounds we have to thank for the aroma, color, and sweetness of this seedy fruit.

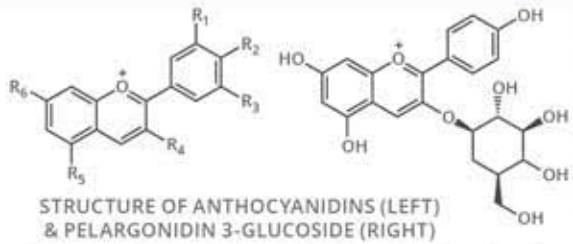
AROMA



FURANEOL (LEFT) & METHOXYFURANEOL (RIGHT)

Two key molecules in the aroma of strawberries are furaneol and methoxyfuraneol. Their concentrations increase as the fruit ripens, reaching a maximum when it's fully ripe. Strawberry-scented perfumes owe their aroma to pure furaneol.

COLOR

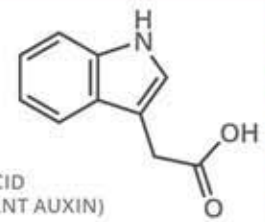


STRUCTURE OF ANTHOCYANIDINS (LEFT) & PELARGONIDIN 3-GLUCOSIDE (RIGHT)

Like many other fruits, strawberries get their color from anthocyanins. These compounds come from the addition of a molecule called an anthocyanidin to a sugar. The major anthocyanin present in strawberries is pelargonidin 3-glucoside.

SWEETNESS & RIPENING

SUGAR CONTENT INCREASE BY WEIGHT



RIGHT: INDOLE-3-ACETIC ACID (THE MOST ABUNDANT PLANT AUXIN)

A variety of compounds contribute to a strawberry's flavor, with sweetness and acidity playing a major role. Sweetness develops as the strawberries ripen, a process driven by auxin hormones. Acidity, primarily from citric acid, decreases during the ripening process.