

THE CHEMISTRY OF WHISKY



PREPARATION

Dried barley added and ground. Husks & debris removed.



MASHING

Water added to dissolve sugars and produce wort.



FERMENTING

Yeast added, and fermentation turns sugars into alcohol.



DISTILLING

Alcohol vapourised and collected. Repeated to increase purity.



AGEING

Alcohol from distillation is stored in oak casks for several years.

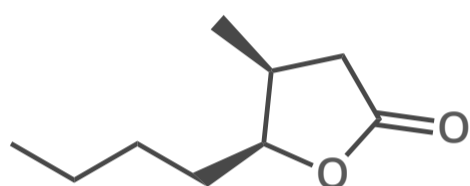


BOTTLING

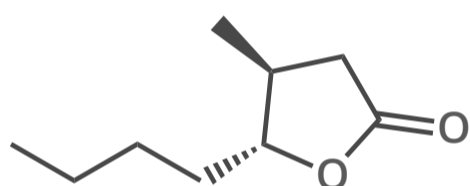
After maturation, the whisky is bottled and ready for consumption.

Whisky contains hundreds of different compounds. These can be influenced by the type of malt and grain used, the distillation process, and the wood used in the barrels used in the ageing process. Whilst it's impossible to list all the compounds that contribute, here's a look at some that impact whisky's flavour.

WHISKY LACTONES



CIS-3-METHYL-4-OCTANOLIDE

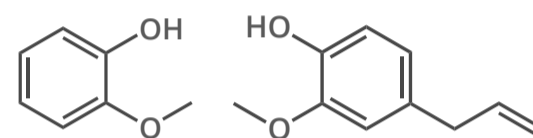


TRANS-3-METHYL-4-OCTANOLIDE

Whisky lactones are found in the oak barrels that whiskey is aged in, and picked up by the spirit during the process. The trans isomer gives a woody, coconut flavour, whilst the cis isomer has a strong, spicy coconut flavour.



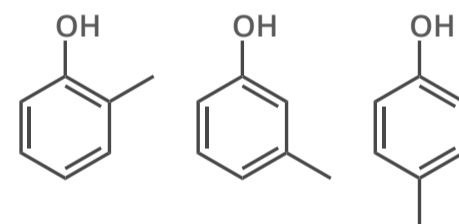
PHENOLIC COMPOUNDS



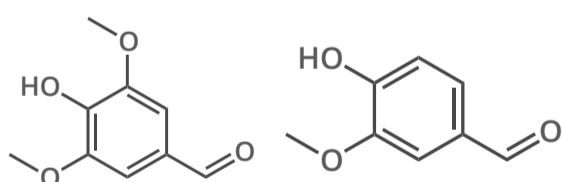
GUAIACOL & EUGENOL

Generally, phenolic compounds contribute smoky flavours and bitterness in whisky. In the case of Scotch whisky, the use of peat fires to help dry the malted barley results in the presence of phenolic compounds, including cresols, which smell medicinal.

o-CRESOL, m-CRESOL & p-CRESOL

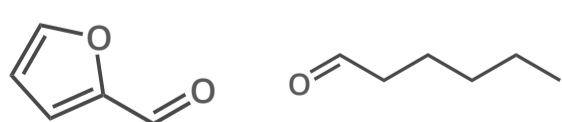


ALDEHYDES



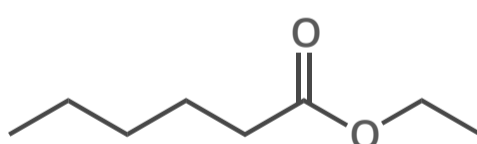
SYRINGALDEHYDE & VANILLIN

A number of different aldehydes can be extracted from oak barrels into the whisky. Syringaldehyde lends a spicy, woody aroma, whilst vanillin gives a vanilla tone. Furfural adds an almond-like grainy flavour, while hexanal offers grassy notes.



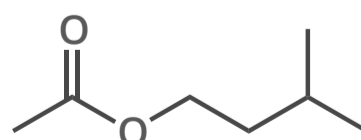
FURFURAL & HEXANAL

ESTERS



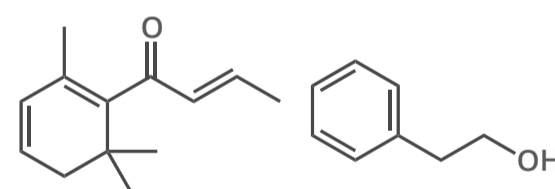
ETHYL HEXANOATE

Esters in whisky can add fruity flavours, such as ethyl hexanoate, which gives a sweet apple flavour. Isoamyl acetate, on the other hand, gives a banana-like, pear drop aroma. Some whiskies are chill filtered to remove the majority of esters, as they can cause cloudiness in the whisky.



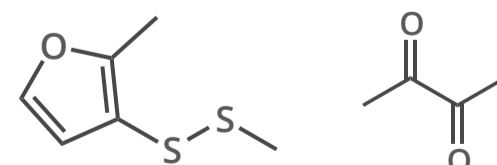
ISOAMYL ACETATE

OTHER COMPOUNDS



B-DAMASCENONE & PHENETHYL ALCOHOL

β -damascenone and phenethyl alcohol add floral notes to whisky. Diacetyl, a common off-flavour in beer, contributes a buttery taste. Other burnt, rubbery off-flavours can be produced by sulfur compounds, though they can also add meaty tones.



2-METHYL-3-(METHYLDISULFANYL)FURAN & DIACETYL

