



DIY haze and deposit identification

A high proportion of questions answered and investigations conducted by the AWRI helpdesk are related to hazes and deposits in wine. While the helpdesk is well equipped to identify both common and unusual hazes and deposits, there are some steps that can be taken in the winery lab or kitchen to achieve a quick DIY identification.

STEP 1 – ISOLATE THE DEPOSIT OR HAZE

THIS CAN BE done by centrifuging a portion of the wine and examining the deposit, settling the deposit in the fridge overnight and then decanting off the wine leaving the deposit behind, or by filtering a portion of the wine through a sterile membrane and collecting the material that is filtered out.

STEP 2 – EXAMINE THE MATERIAL

This is normally done with a microscope, at around 400x magnification, to classify the deposit as either crystalline, microbiological or amorphous in nature.

For winemakers that don't have access to a microscope, there is still a lot that can be found out with the naked eye.

Crystalline deposits are almost always white, and if the crystals are large enough will be easy to distinguish without magnification.

Large crystals can often be confused with glass chips by a consumer, but the more common smaller crystals look more like table salt or sugar. Crystalline deposits normally settle to the bottom of the bottle.

Amorphous deposits, which include protein from white wine, are generally tan/brown in colour and look a bit like dirt or mud settled at the bottom of the bottle.

Protein, phenolics and colour material from red wines are more reddish-brown, and these deposits sometimes coat the inside surface of the bottle, particularly if the wine has not been filtered.

Microbiological deposits are generally wispy in appearance and don't settle as well as protein and phenolic deposits. Wines affected by microbial growth thus generally have a high turbidity. Microbiological deposits tend to be creamy white in colour and can be accompanied by fizz, spritz or excess pressure in the wine.

As wine yeast and bacteria are quite small, a microscope is needed to identify them definitively.

As an alternative, there are some rapid test kits available to determine if for example there are viable *Brettanomyces* cells present, but ideally if a wine is suspected of being affected by a microbial deposit, it should be tested for the presence of viable cells by plating.

STEP 3 – SOLUBILITY TESTS

Testing the solubility of a deposit in a range of solutions can provide a lot of extra information to help with identification. The solutions needed are: a weak solution of sodium hydroxide (0.1M), a weak solution of hydrochloric or sulfuric acid, 50% ethanol and hot water.

Solubility in sodium hydroxide is indicative of a protein/amorphous material; solubility in acid suggests colour material or possibly a metal-based deposit (most commonly copper or iron); solubility just in ethanol indicates colour material; and solubility in hot water indicates a crystalline material.

If the material does not dissolve, and instead can be seen floating on the surface of the liquid, this indicates that the material may be waxy cork coating material, cork dust or even a cleaning agent.

STEP 4 – FLAME TEST FOR CRYSTALLINE DEPOSITS

The most common crystalline deposits found in wine are calcium tartrate and potassium bitartrate and the easiest way to distinguish between the two is to use a flame test. If a deposit looks crystalline and dissolves in hot water, place a small piece on a spatula or spoon and hold it in a low gas flame. Calcium tartrate burns with a red flame and leaves behind a white fluffy residue. Potassium bitartrate burns with a violet/purple flame and leaves behind a black tarry residue. For wines affected by crystalline deposits, it's a good idea to test the cold stability.

STEP 5 – OTHER POSSIBILITIES

If the tests described above are inconclusive, the unidentified haze or deposit could be one of the other materials seen occasionally in wines, such as diatomaceous earth, filter fibres, rubber or pieces of material from the bottling line. If in doubt, samples can always be sent to the helpdesk for confirmation or definitive identification. The helpdesk lab has a high quality microscope and a library of spectral fingerprints of the materials found in wines during the last 20 years of investigations.

For more information about haze and deposit identification or other technical issues, please contact the AWRI helpdesk on helpdesk@awri.com.au or 08 8313 6600.