pasteurization at 80°C (176°F) for 5 seconds, generally does not affect the quality of the fermented wine. Such a treatment is also advisable for juices from grapes with heavy *Botrytis* infections, because the polyphenol oxidase (PPO) laccase — a browning enzyme — in the fungus does not respond to traditional sulfur dioxide treatments at the crusher the way grape PPOs do.

- Tannins derived from chestnut galls that contribute no color and low astringency have the potential to precipitate grape proteins as well as *Botrytis* laccase.
- Mannoproteins from yeast cell walls may act as protective colloids, bind to grape protein and prevent their flocculation.
- Regeneratable cation exchange resins that reversibly bind proteins from wine and do not create solid waste have been used only experimentally.

Potential problems with bentonite fining

Excess amounts of bentonite added to wine can bind not only proteins but also desirable aroma compounds or colloidal materials. Proper bench testing to determine the minimal effective amount to add is important, as that will not have a detrimental effect on the wine. Each individual wine has separate dosage requirements. Routine additions of bentonite will certainly lead to over- or under-dosing, as the requirements may vary by more than an order of magnitude (60 to 1,800 mg/L = 0.5 to 15 lb/1,000 gal). In addition, oxidative damage to the wine may occur if the mixing in of the bentonite slurry allows for air exposure during transfer operations, from the tank headspace, or via subsequent filtration steps.

The heat tests

The quickest (and laziest) test for protein stability after fining treatment is a heat test that exposes a treated and filtered wine sample to a high temperature for a short period of time, e.g. 49°C (120°F) for 48 hours or 90°C (194°F) for one hour, followed by a period of cooling. Such tests are trying to simulate the precipitation of proteins at a proper, cool storage temperature over the lifespan of the wine. It is a rather uninformed assumption that these two scenarios are identical in their outcome.

Moreover, the resulting over-stabilization of commercial wines against excessive heat exposure has significant consequences for the sensory quality of the wine. If the wine experiences extreme temperatures during shipping and storage, its aroma will be damaged but there may be no visible indicators that the wine was treated poorly. Temperature data logging and tracking of shipments can help identify sources of heat exposure within the distribution chain.

A more representative way to assess the effect of fining treatments on the stability of a wine under normal storage and aging conditions is the Boulton ethanol assay that measures the stability of all colloidal materials. It can assess the effect of a bentonite fining treatment on a wine though a titration with successive quantities of ethanol while using a nephelometric turbidity meter to quantify the resulting cloudiness.

Bentonite fining of juice before fermentation may lead to a sluggish fermentation due to its clarification effect on the treated juice and the possibly stripping of certain growth factors, such as fatty acids, phospholipids, and sterols. An extended fermentation can lead to increased amounts of residual fructose in the wine. Since fructose is twice as sweet as glucose, this may affect the perception of the wine's dryness.

Rosé/blush wines

When treating blush/rosé wines, make sure that the bench trials are also evaluated for any loss or change of color associated with the bentonite treatment.

Storage

Proper storage of bentonite — much like filter pads — in a clean, dry environment and in a resealable container is crucial. Bentonite will absorb odors from the air, e.g. the cork taint component TCA, and release them into the treated wine.

Waste issues

Bentonite creates a solid waste problem if separated with the lees. If flushed out of the tank, it can clog drains and sewer lines. In the winery/irrigation pond, it will settle and enhance the seal of the pond bottom. Over the years, however, sludge will gradually accumulate and make the pond more shallow, thereby enhancing light penetration and algae growth.

I think this refers just to the Bentonite in powder form