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Ask Barry Waite...

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Ask Barry Waite is a new feature for answering some of the New York Wine Analytical Lab's most frequently asked questions.

Dear Barry Waite:

I own a small farm winery, and I'm confused as to where the potassium meta-bisulfite I add, and continue to add, has been going. During winemaking, I add 50 ppm at the crush pad, and then another 60 ppm at the first racking. When I check my free SO₂, though, I find I have only 17 ppm free SO₂. I'm running my SO₂ analyses with the Aeration/Oxidation method, and I have checked and re-checked my sample, my method, and my stock solutions. Everything seems fine except my final number. Can you shed some light on this?

Signed: Missing my Meta-bisulfite

Dear Missing:

You describe a very common scenario that's actually the rule, instead of the exception. First, SO₂ (sulphur dioxide) is used for three main reasons; as an antioxidant, an antienzymatic and an antimicrobial. The activity that's causing the effect you see is the first of these three. As an antioxidant (in the bi-sulfite ion form), SO₂ inhibits polyphenol-oxidase browning reaction, scavenges H₂O₂, stabilizes color, and retards a whole series of non-enzymatic browning reactions by combining with intermediate compounds. In these reactions and others, SO₂ is effective because it's binding with a variety of compounds in the wine, including acetaldehyde, anthocyanin pigments, sugars, pectic compounds, and proteins, to name a few. Some, if not most, of these compounds are present in all wines- and this is part of your problem.

The second part of your answer is also related to antioxidant activity. When a wine is in contact with air, oxygen is present, and SO₂ becomes oxidized before phenol compounds in wine. In other words, the SO₂ acts as an oxygen scavenger. As oxygen slowly moves from the atmosphere into the wine, free SO₂ is consumed and the level of free SO₂ decreases. The rate of SO₂ depletion increases with increases in temperature, headspace and the ratio of oxygen-exposed surface area to volume.

So, Missing, you can rest easy- your analyses results are correct. Your free SO₂ is being bound up partly by compounds inherent in the wine, and is also being lost through wine exposure to oxygen.

If you any questions that you would like to ask Barry Waite, please forward care of bkg1@cornell.edu.

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