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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 SO<sub>2</sub>, though, I find I have only 17 ppm free SO<sub>2</sub>. I'm running my SO<sub>2</sub> 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, SO<sub>2</sub> (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), SO<sub>2</sub> inhibits polyphenol-oxidase browning reaction, scavenges H<sub>2</sub>O<sub>2</sub>, stabilizes color, and retards a whole series of non-enzymatic browning reactions by combining with intermediate compounds. In these reactions and others, SO<sub>2</sub> 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 SO<sub>2</sub> becomes oxidized before phenol compounds in wine. In other words, the SO<sub>2</sub> acts as an oxygen scavenger. As oxygen slowly moves from the atmosphere into the wine, free SO<sub>2</sub> is consumed and the level of free SO<sub>2</sub> decreases. The rate of SO<sub>2</sub> 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 SO<sub>2</sub> 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](mailto:bkg1@cornell.edu).*

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