



The Skinny on Sulfites

Potassium Metabisulfite is the most frequently used and most important wine additive.

Chemical Name: Potassium Metabisulfite, $K_2S_2O_5$

“Nicknames”: Sulfites, Sulfite powder, Meta

Potassium Metabisulfite powder is crystalline in structure and is a white to slightly cream colored powder. It has a very pungent sulfur aroma that will irritate your nose, throat and lungs if inhaled directly. Use caution when working with the powder, always making sure you are in a well ventilated area and do not expose your eyes or skin to the product.

Potassium Metabisulfite has two primary functions in winemaking: antimicrobial and antioxidant. It can be used in a stronger solution form to sanitize winemaking vessels and equipment or as an additive to the wine to both prevent oxidation and unwanted microbial growth.

Forms of Potassium Metabisulfite:

Powder Form: Most precise form of sulfite addition. Odor can be unpleasant to work with. Gram scale needed to measure properly. Must be stored in airtight container to preserve potency. Powder should be dissolved in a small amount of water and stirred in.

Campden tablets: A Campden tablet adds 67ppm of total sulfur dioxide to one gallon of liquid (wine must). Because some of it reacts quickly with anthocyanins within the wine, it yields about 50ppm of free sulfur dioxide. Tablets should be crushed up and dissolved in water before stirring in. Difficult to accurately dose.

Indose Tablets: 66% potassium metabisulfite, 33% potassium bicarbonate. Potassium bicarbonate acts as a dispersal agent for the metabisulfite. (fizzes) Easiest way to add SO_2 as they self-disperse. 2gram or 5gram tablets. Most expensive means of sulfite addition. Potassium bicarbonate does not have an effect on the pH of the wine.

Free vs. Total SO_2

When Potassium Metabisulfite is added to wine in any form, some of the sulfites are immediately bound to reactive compounds such as polyphenols, flavonoids, and anthocyanins. This prevents the polyphenols from breaking down into quinones, which are responsible for the brown tones in oxidized wine. The sulfites also interfere with the reaction of O_2 molecules with the wine to form H_2O_2 , hydrogen peroxide, which is a powerful oxidizer. Hydrogen peroxide can react with the ethanol (alcohol) within the wine to form acetaldehyde, the oxidizing compound within wines. Acetaldehyde produces the rotten apple, sherry-like, reductive aroma.

Addition Quantity and Timing

How much sulfite should I add and how often? This is a question asked very often by winemakers. It is important to first know how much sulfites are present in the wine that you are working on. If the wine is “fresh”, as in just completed its primary alcoholic fermentation and secondary bacterial fermentation, if needed, then the sulfite addition needs to be significantly higher as much of the sulfite will be instantly bound to the reactive compounds. This is not to say that it damages or inactivates the compounds, but binds to them to preserve them. Winemaker Magazine has an online sulfite calculator



that will greatly assist you in calculating the precise amount of sulfite to add. It is important to adjust the addition rate, depending on the timeline of the wine to accommodate the binding of SO_2 . Using the sulfite calculator, there is a %adjustment factor that you can adjust to accommodate the rate of SO_2 binding. For example, if the wine is very young, (first inoculation of SO_2) you would want to set the % adjustment factor at 100%, as to accommodate much of the SO_2 being immediately bound by reactive compounds. As the wine ages, many of these compounds become bound to SO_2 and the %adjustment can be lowered to 33% or 0%. A very low percentage, such as 0%, should be reserved for aged wine that is stable and the free SO_2 level does not drop much between testing.

Notes: