

Use of Copper Sulfate

Basic Use of Copper Sulfate

- Why use Copper?
 1. Stinky (Sulfury, Rotten egg, Onion, Cabbage)
 - Hydrogen Sulfide (H₂S)
 - Mono & Di-Mercaptan
 2. Vegetal or leafy smell
 - Methoxy-pyrazine
 3. Determination Test
 - Glass #1 Control 100ml wine
 - Glass #2 100 ml wine and a few drops of 1% Soln. Copper Sulfate
 - Glass #3 100 ml wine, 10 drops 1% Ascorbic, three minutes wait, a few drops Copper Sulfate.
 - Obviously glass #1 smells or you wouldn't be testing, if glass #2 has no more bad smell you have H₂S or Mono-Mercaptans, if glass #2 has a smell, maybe slightly less and glass #3 is remedied, then you have Di-Mercaptan and must treat with Ascorbic.
- Treatment
 - H₂S is a volatile chemical and can be removed with aeration, i.e. a splash racking. Caution is necessary; this may also advance the formation of Mercaptan from H₂S.
 - Copper Sulfate can be used quite effectively against H₂S, and Mono-Mercaptans via a complexing action, eliminating the off odor.
 - Legal limit for commercial wineries is 0.5ppm **Residual Copper**.
 - Di-Mercaptans are not directly treatable with Copper and need to change back to Mono- and or H₂S with the use of Ascorbic acid.
 - Calculations for Copper additions
 - 0.1 ppm = 3ml of 0.05% Copper Sulfate / Gallon
 - 0.1 ppm = 0.15 ml of 1% Copper Sulfate / Gallon
 - Calculations for Ascorbic Additions
 - 10 ppm Ascorbic = 3.78 ml of 1% Ascorbic Soln. / Gallon
 - Suggested treatment
 - Copper to add in ppm

Slight odor	Medium	Intense
0.1–0.3 ppm	0.2-0.4 ppm	0.3-0.5ppm
 - Ascorbic to add in ppm

Slight odor	Medium	Intense
10, 20, 30ppm	20, 40, 60ppm	50, 75, 100ppm

Notes: Make sure that your wine has free SO₂ before adding Ascorbic Acid, it is a very strong anti-oxidant, but not in a way that it will protect like SO₂, it will easily bind O₂ and then later release it and cause your wine to age very rapidly, is the nice way to say this. Also, when using the Ascorbic treatment you must **wait several days if not a week** for the desired reactions to take place, **before you add the Copper Sulfate**. Another recommended procedure would be to filter the wine with activated charcoal. Fining with charcoal is better, but very difficult at best to remove from the wine, at the home winemaker level. From this point on keep up the SO₂ level and check often.