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What Is The Proper pH Range Of Wine?

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I just had two batches of wine tested for pH levels. One is a Cabernet made from plain juice and its pH is 3.78. The other wine is a Merlot, also made from plain juice and its pH is 4.01. After I drew the samples to be tested I racked both batches of wine and added a quarter tsp. of potassium metabisulfite, both are six gallon batches. Are these in the proper pH range to bottle in a couple more months? If not what do you suggest?

Name: Michael B.

State: PA

Hello Michael,

When we talk about the pH range of wine we have to remember that what we are really talking about is the acidity of the wine. The higher the acidity, the more resistant it will be towards bacterial and mold contamination. Acidity also plays a big role in the flavor profile of the wine. If it didn't we would just keep adding fruit acids to the wine until it would be completely protected. But the fact is if we did do this the wine would taste extremely sharp or tart.

With that being said, there is a general pH range of wine that we look for – a happy medium, if you will. It's a range that makes the wine generally safe from spoilage and still great to drink. Depending on the style of wine, a pH range of 3.2 to 3.6 usually fits this bill. Some wines taste better at one end of the range and others at the opposite end, so tasting the wine is recommended as well as pH testing for a final tweaking. In general, white wines have a higher level acidity than red wines. Fruit wines usually have less acidity than either red or white wines.

At a pH of 3.78, your Cabernet is a little out of this range but not by much. I would consider it safe to bottle as-is. For this reason I would go by taste at the point on this particular wine. Remember, the pH scale works backwards, so the wine's pH of 3.78 is low in acid even though it's pH reading is a higher number than the 3.6 mentioned before. As you go up in acidity your pH will go down.

Actually taste a sample of the wine and see how it tastes. If it taste fine, then do nothing. If it tastes too



flat or lifeless, then you need to raise the acid level (lower the pH). This can easily be done with the addition of acid blend. It dissolves instantly into the wine.

How much acid blend to add to any wine to get it into the proper pH range is another question. Since the pH scale is not an even scale, but rather a log or exponential scale, how much you need to add to get from point A to point B depends on what part of the scale you are on. For this reason I recommend taking a sample of the wine and adding measured amounts of acid blend to it until you get it into the proper pH range of wine. If you mess up the sample with too much acid blend, pour it back in with the rest of the batch and start all over. If you get it right, apply the same dosage rate of acid blend to the rest of the batch.

As for your Merlot, the pH of 4.01 is lower in acid than we would like to ward off spoilage. I recommend that you add some acid blend to the wine before bottling, regardless of taste. As before, start with a sample and shoot for a pH reading of 3.7 with your pH strips or digital pH meter. Once you get the entire batch in the proper pH range for the wine, then you can start tasting it and making final adjustments.

Happy Winemaking,
Ed Kraus



[Shop Digital pH Meter >>](#)

STOCK SOLUTION OF SO₂

A third way to add potassium metabisulfite is to make a stock solution. Dissolve 5 level tablespoons of potassium metabisulfite in 1 quart water.

1/4 tsp stock solution = about 18 ppm SO₂ per gallon

1/2 tsp stock solution = about 36 ppm SO₂ per gallon

1 tsp stock solution = about 72 ppm SO₂ per gallon

BALLING AND BRIX READINGS

DEGREES BALLING/BRIX ^a	SPECIFIC GRAVITY	% POTENTIAL ALCOHOL YIELD ^a	DEGREES BALLING/BRIX ^a	SPECIFIC GRAVITY	% POTENTIAL ALCOHOL YIELD ^a
0.00	1.0000	0.00	14.50	1.0575	8.34
0.50	1.0019	0.29	15.00	1.0594	8.63
1.00	1.0038	0.58	15.50	1.0616	8.91
1.50	1.0058	0.86	16.00	1.0639	9.20
2.00	1.0077	1.15	16.50	1.0660	9.49
2.50	1.0097	1.44	17.00	1.0680	9.78
3.00	1.0116	1.73	17.50	1.0701	10.06
3.50	1.0136	2.01	18.00	1.0723	10.35
4.00	1.0155	2.30	18.50	1.0746	10.64
4.50	1.0174	2.59	19.00	1.0769	10.93
5.00	1.0193	2.88	19.50	1.0793	11.21
5.50	1.0212	3.16	20.00	1.0814	11.50
6.00	1.0232	3.45	20.50	1.0836	11.79
6.50	1.0252	3.74	21.00	1.0859	12.08
7.00	1.0271	4.03	21.50	1.0881	12.36
7.50	1.0291	4.31	22.00	1.0903	12.65
8.00	1.0313	4.60	22.50	1.0926	12.94
8.50	1.0334	4.89	23.00	1.0949	13.23
9.00	1.0372	5.45	24.00	1.0994	13.80
10.00	1.0393	5.57	24.50	1.1017	14.09
10.50	1.0414	6.04	25.00	1.1041	14.38
11.00	1.0434	6.33	25.50	1.1063	14.66
11.50	1.0454	6.61	26.00	1.1086	14.95
12.00	1.0475	6.90	26.50	1.1109	15.24
12.50	1.0495	7.19	27.00	1.1133	15.53
13.00	1.0515	7.48	27.50	1.1155	15.81
13.50	1.0536	7.76	28.00	1.1180	16.10
14.00	1.0556	8.05			

Note: Balling and Brix readings compared to specific-gravity readings in fresh juice and potential yield of alcohol in finished wine.

^a1° Balling or Brix = 0.575% alcohol (approximate).

Common Fining Agents

Agent	Description	Use	Rate	Comments
<i>Bentonite</i>	Fine, colloidal clay powder	clarification & protein stabilization	1-2 g/gallon (0.25-0.5 g/l)	mix in hot water 1 day before using
<i>Gelatin</i>	powder or liquid from skin & bones of cattle	white juice and young white wines to remove bitterness	0.06-0.5 ml/gal (0.015-125 ml/l) or 0.5-1.0 g/gal (0.125-0.25 g/l)	can strip wines; often counter-fined with Bentonite
<i>Egg Whites</i>	fresh, mixed with a pinch of salt	red wines only; gives supple finesse to finish	2-8 egg whites per 60-gal (225-l) barrel; 1/2 egg white per 5-gal (19-l) carboy	mix gently, do not whip eggs
<i>Isinglass</i>	powdered swim bladder of sturgeon fish	delicate white wines; removes bitterness; gentle to wine	0.01-0.1 g/gal (0.0025-0.025 g/l)	mix with cold water; does not settle well
<i>Casein</i>	powdered skim milk; potassium caseinate	clarifies white wines and reduces oxidized flavors & aromas	1-2 g/gal (0.25-0.5 g/l)	can substitute store-bought, powdered milk
<i>Sparkolloid</i>	proprietary, alginate based	clarifies white wines, neutral flavor	0.5-1.5 g/gal (0.125-0.4 g/l)	hot mix and cold mix formulations available

A Sampling of Yeast Types (Continued from previous page)

RED STAR YEASTS

SENSORY EFFECT

Wine Types	Côte des Blancs	Flor Sherry	Montrachet	Pasteur Champagne	Pasteur Red	Premier Cuvée
<i>Red</i>	●		●	●	●	●
<i>Blush</i>	●					●
<i>White</i>	●		●	●		●
<i>Sparkling</i>	●					●

SENSORY EFFECT

<i>Fruity Esters</i>	●					
<i>Aldehydes</i>		●				
<i>Full-Bodied</i>			●		●	
<i>Neutral</i>				●		●

OTHER CHARACTERISTICS

<i>Vigorous Fermenter</i>			●	●	●	●
<i>Ferment to Dryness</i>			●	●	●	●
<i>Restart Stuck</i>				●		●
<i>Ethanol Tolerant</i>		●		●		●
<i>SO₂ Tolerant</i>	●	●	●	●	●	●
<i>Low Foaming</i>	●					●

NOTE: Not all varieties of Red Star and Lalvin yeasts are represented in these charts, nor are all yeasts.

ADDING SUGAR TO JUICE

DEGREES BRIX/BALLING OF JUICE	SPECIFIC GRAVITY READING	CUPS SUGAR PER GALLON OF JUICE	CUPS SUGAR PER 5 GALLONS OF JUICE
0	1.0000	4 3/4	23 1/2
1	1.0038	4 1/2	22 1/2
2	1.0077	4 1/4	21 1/2
3	1.0116	4 1/8	20 1/2
4	1.0155	3 7/8	19 1/2
5	1.0193	3 3/4	18 1/2
6	1.0232	3 1/2	17 1/2
7	1.0271	3 1/4	16 1/2
8	1.0313	3	15 1/2
9	1.0352	2 7/8	14 1/2
10	1.0393	2 3/4	13 1/4
11	1.0434	2 1/2	12 1/4
12	1.0475	2 1/4	11 1/2
13	1.0515	2	10
14	1.0556	1 7/8	9
15	1.0594	1 1/2	8
16	1.0639	1 3/8	6 3/4
17	1.0680	1 1/8	5 3/4
18	1.0723	7/8	4 2/3
19	1.0769	3/4	3 1/2
20	1.0814	1/2	2 1/4
21	1.0859	1/4	1 1/4
22	1.0903	0	0

ADDING SULFUR DIOXIDE

POTASSIUM METABISULFITE (FOOD GRADE) POWDER

If you are making 5 or more gallons of wine, the easiest way to add SO₂ is to use the powder form of potassium metabisulfite because it dissolves easily. If you are making less than 5 gallons of wine, however, potassium metabisulfite is hard to measure. One gram of potassium metabisulfite provides about 150 ppm of SO₂ per gallon of wine, but most home winemakers do not have scales to weigh 1 gram.

1 gram = about 150 ppm SO₂ per gallon; 30 ppm per 5 gallons

1/4 tsp = about 1.5 grams or about 225 ppm SO₂ per gallon; 45 ppm per 5 gallons

1/2 tsp = about 450 ppm SO₂ per gallon; 90-ppm per 5 gallons

CAMPDEN TABLETS

For those who make just 1 gallon of wine, the Campden tablet is the easiest way to add potassium metabisulfite. One tablet equals about 70 ppm SO₂ per gallon. Crush and dissolve the tablet in 1/4 cup warm water and add to the must.