



Protocols for Fining Trials



The following is a recap of the talk given by Chik Brenneman, Student Winery Director, at Wine Flavor 101, U.C. Davis, January 15, 2015

Fining Trials and Tips

Purpose

To prepare fining agents and to perform small lab trials with various fining agents. This procedure details the preparation and setting up of fining trials for gelatin, isinglass, egg white, casein, carbon, and PVPP. Bentonite is covered separately

Background

The addition of adsorptive compounds, which is followed by settling or precipitation of partially soluble components from wine, is defined as **fining**.

Fining is carried out to promote clarification, or remove excessive levels of wine components that detract from the overall quality of the wine.

Fining trials are set up to optimize the level of addition, so that neither too much nor too little fining agents are added.

Related Equipment and Materials

General notes – For raw materials used in fining, obtain material from cellar inventory to ensure trials are set up to replicate processes occurring in the cellar. Some agents are kept in the lab refrigerator or freezer prepared and ready for setup. Verify inventory prior to preparing new trials. Verify solutions are not contaminated by observing for mold or other signs of microbial contamination.

You'll need:

- **375ml bottles, caps, funnel**
- **Potassium Chloride (KCl)**
- **Distilled or deionized Water referred to as RO-DI water in this procedure**
- **Scale capable of measuring in grams up to 1 kilogram**

Egg white (4.8%) – Also referred to as albumin. Used to reduce astringency in red wines. Not applicable for use in white wines

- Weigh egg white on digital balance using a large plastic weigh boat.
- Calculate volume in milliliters of DI water needed. Total volume of DI H₂O = egg weight
- Use KCl to facilitate mixing. (0.031g KCl per gram egg white)
- Add egg white, RO/DI water, and KCl to mixing vessel.
- Mix gently until homogenous mixture is obtained. Avoid foaming.
- Transfer solution to an Erlenmeyer flask. Label and date the preparation.
- Stable for three months if kept frozen.

Gelatin, (4.8%, or 1.2%) - Used to reduce astringency in red wines. Used to reduce astringency in juices before fermentation. Can be used to counterfine bentonite haze.

- Weigh out gelatin.
- For 4.8%, measure 4.8g/ 100ml DI water
- For 1.2%, measure 1.2g/ 100ml DI water
- Add gelatin to a DRY volumetric flask
- Add HOT RO/DI water until 2/3 full. Slowly mix until dissolved
- Bring up to volume with DI water and transfer solution to an Erlenmeyer flask for storage
- Transfer solution to an Erlenmeyer flask for storage. Label flask with fining agent, date, and initials. Store in the refrigerator. Solutions can be used for up to two months, as long as no visible contamination is present.

Isinglass (1.2%) – Used in white wines to bring out or unmask the fruit character without significant changes in tannin level. Helps hold the body of the wine.

- Prepare pH adjusted RO/DI water, if needed.
- Determine volume of water needed (+ 50mls extra) for trial and add to a beaker.
- Place pH probe into water.
- Slowly add citric acid to adjust the pH between 2.5 – 2.9.
- Working Isinglass solution (1.2%)
- Weigh out isinglass, measure 1.2g/ 100ml DI water.
- Add isinglass to a DRY volumetric flask.
- Slowly add pH adjusted water until 2/3 full.
- Hydrate solution for 24 hours.
- After 24 hours, bring to volume with pH adjusted water and mix again.
- Transfer solution to an Erlenmeyer flask for storage. Label flask with fining agent, date, and initials. Store in the refrigerator.
- Solutions can be used for up to two months, as long as no visible contamination is present.

PVPP (4.8%, or 1.2%) - Useful in toning down the bitterness in red or white wines.

- Weigh out PVPP.
- For 4.8%, ratio = 4.8g/ 100ml DI water.
- For 1.2%, ratio = 1.2g/ 100ml DI water.
- Suspend PVPP in DI water.
- Bring up to volume and transfer solution to an Erlenmeyer flask for storage
- Transfer solution to an Erlenmeyer flask for storage. Label flask with fining agent, date, and initials. Store in the refrigerator. Solutions can be used for up to two months, as long as no visible contamination is present.

Casein, AKA Kolorfine, (1.2%) - Used in white wines to reduce oxidized color and character.

- Weigh out Casein.
- For 1.2%, ratio = 1.2g/ 100ml DI water.
- Add casein to a DRY volumetric flask.
- Add HOT DI water until 2/3 full.
- Thoroughly mix until dissolved (~2 hours).
- Allow solution to come to room temperature.
- Bring up to volume with DI water and mix again.
- Transfer solution to an Erlenmeyer flask for storage. Label flask with fining agent, date, and initials. Store in the refrigerator.
- Solutions can be used for up to two months, as long as no visible contamination is present.

Carbon (4.8%) – Non-specific binding agent. Can be detrimental to wine in high concentrations making bench trials very important

- Weigh out 4.8 grams Carbon
- Place in flask and suspend into 100 milliliters RO/DI water. Transfer solution to an Erlenmeyer flask for storage. Label flask with fining agent, date, and initials. Store in the refrigerator.
- Solutions can be used for up to two months, as long as no visible contamination is present.

Yeast (4.8%) – Use to reduce off characters or oxidative characters in problem wines. Can be used to revitalize white wines.

- Prepare 4.8% yeast solution.
- Use the yeast currently as specified by winemaking.
- Weigh out 12g of yeast using the digital balance.
- Hydrate yeast in ~100ml of warm (~100-104°F) cellar water.
- Stir for 15 minutes.
- Pour yeast slurry into a 250ml volumetric flask.
- Bring up to volume with water.

General Procedure

Make Trial Setups. Add fining agents to wine according the following charts.
Stir agents continuously while pipetting.

AMOUNTS (mL) TO ADD TO SAMPLE BOTTLES TO EQUAL CELLAR DOSES (in lb/1000G)

% Soln	100 mL sample bottle							250 mL sample bottle						
	1/8 lb	1/4 lb	1/2 lb	1 lb	2 lb	4 lb	8 lb	1/8 lb	1/4 lb	1/2 lb	1 lb	2 lb	4 lb	8 lb
1.0	0.15	0.30	0.60	1.20	2.4	4.8	9.6	0.38	0.75	1.50	3.0	6.0	12.0	24.0
1.2	0.12	0.25	0.50	1.00	2.0	4.0	8.0	0.31	0.62	1.25	2.5	5.0	10.0	20.0
2.0	0.07	0.15	0.30	0.60	1.2	2.4	4.8	0.19	0.38	0.75	1.5	3.0	6.0	12.0
2.4	0.06	0.12	0.25	0.50	1.0	2.0	4.0	0.16	0.31	0.62	1.25	2.5	5.0	10.0
4.5	0.03	0.07	0.13	0.27	0.53	1.1	2.1	0.08	0.17	0.33	0.67	1.33	2.7	5.3
4.8	0.03	0.06	0.12	0.25	0.50	1.0	2.0	0.08	0.16	0.31	0.62	1.25	2.5	5.0
5.0	0.03	0.06	0.12	0.24	0.48	0.96	1.9	0.07	0.15	0.30	0.60	1.20	2.4	4.8

% Soln	375 mL sample bottle							750 mL sample bottle						
	1/8 lb	1/4 lb	1/2 lb	1 lb	2 lb	4 lb	8 lb	1/8 lb	1/4 lb	1/2 lb	1 lb	2 lb	4 lb	8 lb
1.0	0.56	1.12	2.25	4.50	9.0	18.0	36.0	1.12	2.25	4.5	9.0	18.0	36.0	72.0
1.2	0.47	0.94	1.87	3.75	7.5	15.0	30.0	0.94	1.87	3.75	7.5	15.0	30.0	60.0
2.0	0.28	0.56	1.12	2.25	4.5	9.0	18.0	0.56	1.12	2.25	4.5	9.0	18.0	36.0
2.4	0.23	0.47	0.94	1.87	3.8	7.5	15.0	0.47	0.94	1.87	3.8	7.5	15.0	30.0
4.5	0.12	0.25	0.50	1.00	2.0	4.0	8.0	0.25	0.50	1.00	2.0	4.0	8.0	16.0
4.8	0.12	0.23	0.47	0.94	1.9	3.8	7.5	0.23	0.47	0.94	1.9	3.8	7.5	15.0
5.0	0.11	0.22	0.45	0.90	1.8	3.6	7.2	0.22	0.45	0.90	1.8	3.6	7.2	14.4

% Soln	1000 mL sample bottle							3785 mL sample (1 Gallon)						
	1/8 lb	1/4 lb	1/2 lb	1 lb	2 lb	4 lb	8 lb	1/8 lb	1/4 lb	1/2 lb	1 lb	2 lb	4 lb	8 lb
1.0	1.50	3.00	6.00	12.0	24.0	48.0	96	5.62	11.25	22.50	45.0	90.0	180	360
1.2	1.25	2.5	5.00	10.0	20.0	40.0	80	4.69	9.37	18.75	37.5	75.0	150	300
2.0	0.75	1.50	3.00	6.0	12.0	24.0	48	2.81	5.62	11.25	22.5	45.0	90	180
2.4	0.62	1.12	2.50	5.0	10.0	20.0	40	2.34	4.69	9.37	18.7	37.5	75	150
4.5	0.33	0.67	1.33	2.7	5.3	10.7	21	1.25	2.50	5.00	10.0	20.0	40	80
4.8	0.31	0.62	1.12	2.5	5.0	10.0	20	1.17	2.34	4.69	9.4	18.7	38	75
5.0	0.30	0.60	1.20	2.4	4.8	9.6	19	1.12	2.25	4.50	9.0	18.0	36	72

Chart courtesy of Lisa Van de Water

For excellent advice from Lisa Van de Water on "Bench Trials to Cellar Additions".

Click on <http://www.bsgwine.com/TechReference.htm>

Procedural Notes

- Select clean 375 ml bottles. These will hold approximately 400 milliliters, for which these charts are calculated. Adjust volumes and addition rates for any other volumes to be used.
- If using casein, add before any other fining agent, add the wine, then add remaining fining agents. Pour wine into bottle, filling to neck. Leave approximately one half inch of headspace and invert to mix.
- Top off each bottle with wine using a small pipette.
- If fining agent addition rate is to be greater than 10 milliliters per 400 milliliters of sample, a more concentrated solution should be prepared. Adjust preparation as necessary. Make a note this deviation on the fining request form.

References

- Techniques for Chemical Analysis as Stability Tests of Grape Juice and Wine, Iland, et.al., University of Adelaide, Adelaide, South Australia, Australia