

**Caution:** The solvent is **FLAMMABLE** and **Poisonous**. Use only in a well ventilated area.  
**KEEP OUT OF REACH OF CHILDREN!**

### Malolactic Chromatography Set and Reagents - Vertical Style Kit

Vertical Chromatography Set Contains:

Plastic jar and lid

Capillary Pipettes (however you may use toothpicks if you wish)

Chromatography Paper

Chromatography Solvent (n-butyl alcohol, formic acid and bromcresol green)

Acid Standard Solutions (Malic, Lactic and Tartaric)

The Malolactic Chromatography set and reagents are designed to detect the organic acids tartaric, malic and lactic. The test uses Chromatography paper that provides a wicking action drawing the acids up the paper via the solvent. Each acid leaves a residue on the paper in a consistent location. The presence or absence of this residue indicates the presence or absence in your test solution.

The test consists of spotting small amounts of your wine/juice sample along the bottom edge of the paper. Then placing the bottom edge of the paper in the solvent until the solvent wicks up to the top of the paper.

First, draw a line with a pencil (ink will run and ruin things) about 1" above the bottom edge of the long side of the chromatography paper included in the kit. Pencil six or seven "X's" equally spaced along the line and label each with the name of the samples to be tested (including the acid standards for comparison). Add the date of the tests.

Fold a couple of sheets of ordinary typing paper into roughly 1" pleats accordion style. Lay the chromatography paper on one of these and use the other to hold the capillary tubes. Fill a capillary for each of the samples to be tested by dipping it in the liquid until it rises pretty well to the top of the tube. Touch the end of each tube briefly to the "X" mark it belongs to. Make sure the wet patch formed is a maximum ½" across. Let the patches dry then re-apply the capillaries. Continue this process until the capillaries are empty. In this way you create a concentrated patch for each sample. When the spots are dry following the final application, staple the sides of the chromatography paper together to form a cylinder (spots should face outward). Handle the paper by the edges – fingerprints could interfere with your results.

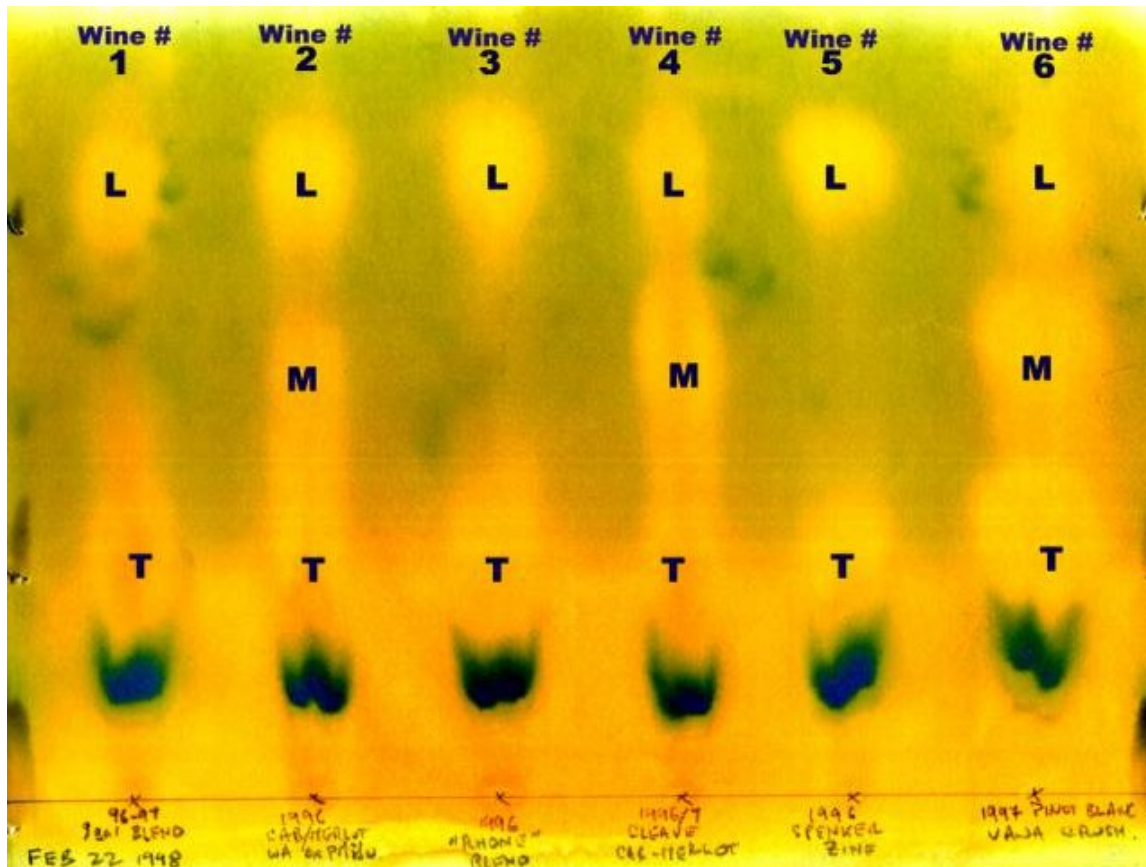
Pour the chromatography solvent into the bottom of the jar supplied. Lower the cylinders of chromatography paper, with "X" marks downward (facing outward), into the jar, and seal the jar. It will take about 8 hours for the solvent to get within an inch of the top of the paper; do not allow it to go all the way to the top.

As the chromatography solvent makes its way up, it carries the various acids with it. The lactic acid, marked L on the picture, moves the furthest. Second furthest, marked M, is the malic acid. Tartaric acid moves the least of all and is marked with a T. When the solvent is close to the top (don't let it go past), take the paper cylinder out and put it upright on a piece of paper towel somewhere well ventilated to dry. It will take a day or even more for the colors to completely develop, depending on temperature and air circulation (careful use of a hair dryer will speed the drying). When it is done, you will see yellow patches representing the acids against a greenish background.

Return left over solvent to it's container and seal for reuse.

See example Below: Wine sample is spotted on the line at each "X". "T", "M" and "L" show the location and typical spots for Tartaric, Malic, and Lactic Acid.

Note that wines #s 1, 3 and 5 have completed MLF, while #s 2, 4 and 6 have not. Of those uncompleted, #2 is furthest along with #6 the least.



**Notes:**

- The solvent may be reused until the developed spots become elongated and no longer identifiable.
- This is a sensitive test, handle the paper as little as possible and make sure your work surface is clean.
- Smaller more compact spots provide better resolution.