

DIY Nicotine eLiquid Test

Supplies Needed

- 10ml graduated cylinder with .1 ml graduations.
- .12N Sulfuric Acid. (referred to as 'acid' in the document)
- Bromothymol Blue (referred to as 'blue' in the document)
- 3ml pipette
- Mixing rod
- Distilled Water

The Procedure

- (1) Read this entire document from start to finish.
- (2) Rinse the cylinder/pipette/stirring rod with distilled water.
- (3) Repeat step 2.
- (4) Repeat step 2.
- (5) Vigorously shake out excess water from the cylinder and pipette.
- (6) Shake your ejuice well and put EXACTLY 1ml of ejuice in to the cylinder.
- (7) Add 2 drops of blue. (when testing 40+ mg nicotine, you can add 4 drops of blue)
- (8) Fill cylinder to the 3mL mark with distilled water
- (9) Mix using the rod and lightly swirling the cylinder, making the entire mixture blue.
- (10) Add a drop or two of acid
- (11) Mix well using the rod (twirl rod between finger tips while moving up and down)
- (12) Repeat steps 10-11 until the entire solution turns pale yellow.
- (13) Measure the final volume and subtract 3. (this is the amount of acid you put in)
- (14) Multiply that number with 19.47
- (15) The resulting number is the mg/ml
- (16) Clean up using paper towel/water.

Example

- Cylinder is rinsed well.
- 1mL of ejuice labeled 24mg is added to the empty cylinder.
- 2 drops of blue are added
- Distilled water is added until its at 3mL
- The solution is swirled/mixed.
- Since I know it should test around 24mg, I add .9 ml of acid initially and mix.
- to be more precise now, A drop of acid is added, then its swirled/mixed, and this is repeated ...
- The solution turns yellow after several 'drop and swirl's
- The final volume is measured at just over 4.2mL
- Subtract 3 to get 1.2
- Multiply this by 19.47 to get ~23.3, which is the actual mg/ml

Notes/Tips/tricks

- It is important to rinse the supplies well with distilled water to clean out any remaining acid/juice/'outside' factors/etc..
- Always measure from the meniscus. (The bottom portion of the 'bubble' in the center of cylinder) not the sides. However you might find that some thicker liquids, or that contain some thick VG, a good meniscus does not form. Also plastic cylinders sometimes do not a meniscus. If this is the case, measure from the top of the liquid.
- It is important to shake/mix your ejuice well before testing, especially thicker VG mixes. I have personally tested VG mixes, without shaking, and got results almost twice as high or low as they should be. After shaking the ejuice and retesting, the results were where they should be. This tells me the nicotine can separate after sitting for a while, and the 1ml sample I extract to test with has a much higher or lower concentration than the rest of the juice.
- Avoid dribbling liquids down the sides, as it will skew results, since some will add to the amount when you mix. Use the pipette to add the ejuice (if it is not already in a dropper bottle) and water because you can insert way down into the cylinder before putting it in to avoid getting on the sides.
- If using the pipette to add the ejuice in step 6, make sure you rinse it out well with distilled water before adding the water in step 8 because you don't want to introduce additional ejuice in to the mixture skewing your results.
- When doing steps 10-11, make sure to mix the solution WELL using the rod. Some of the thicker eliquid will be at the bottom not mixing with the acid. You might see the top 2/3's of the solution yellow, and the bottom 1/3 still blue. Everything needs to be mixed so ALL the eliquid comes in contact with ALL the acid.
- Also when doing steps 10-11, its best to try and leave the mixing rod inside the cylinder at all times. If you remove the mixing rod, I notice about .05 or so of the solution sticks to the rod, and is removed. That means if you remove it several times throughout the test you could be removing as much as .1 -.2 ml of volume, throwing off your results as much as 2-4mg or so.
- When adding the acid and mixing, the color will go from blue to bluish-green to green, to yellowish-green, to yellow with still a tint of green, and when you've reached the 'magic drop', it will turn all yellow. Holding the cylinder up to a white background, you will be able to tell the difference between yellow, and yellow with a tint of green.
- With about every 1 ml of acid added, that will be around 20mg of nicotine be tested. So if you are testing ejuice that should be 24mg, then it is pointless to repeat steps 10-11, 1 drop at a time in the beginning. I'll bulk add like .8 ml of acid initially, then mix, then do it at 1 or 2 drops at a time after that.
- Remember, this is a simple DIY test. Most of us didn't ace chemistry in high school, but I think the average person should be able to read within .1ml of accuracy, making the margin of error less than 2mg of nicotine content, which is 'close enough' . Do the test a few times and average out the results if needed. As you do the test several times, you'll get a feel for it, and become more accurate.

Care/Caution/Cleanup:

- The .12N sulfuric acid and blue are designed for use by average home owners. They are quite safe to use. The acid is very diluted, so it won't eat holes in things. If you get it on your skin, it might itch. If you get under your fingernails it can sting. Just wash your hands with water. Actually, lemon juice is more irritating than the .12 Acid.
- Bromothymol Blue will stain anything it gets on. There is no hazard with blue (its actually sold with children's chemistry sets), but will stain if spilled. (even on porous counter tops/wood/etc..)
- The real danger of testing is posed by the e-liquid. If you're testing high nicotine content liquid, a ml would be enough to kill children, pets, animals, even you. If you're working with very high strength, I'd caution you to use latex, rubber, or vinyl gloves and do the test in a well ventilated area. (But if you make your own juices, then you already know this)
- Disposal of solution after test you should be fine pouring it in the drain, so long as you flush the drain after with some water.
- Rinse your testing equipment clean with plain old tap water, shake off excess water, and let air dry. The liquid does get sticky, and gets hard to clean, if left to dry on.