

Updated Feb. 02, 2010. Thanks to SilverFox who pointed out that the citric acid activator is mixed by volume and the MMS solution by weight! In case that some vendors prepare the citric acid solution by weight, I present both in this table. The orange column shows the number of drops for citric acid solutions prepared with concentrations by volume, probably the most common.

I have compiled a lookup table for accurate stoichiometric number of activator drops for a given number of MMS drops and activator percentage used.

The MMS solutions are (or should be) prepared by 'weight percentage', while the citric acid solutions are commonly prepared by 'volume percentage'. The other activator solutions are probably prepared by 'weight percentage'. At the bottom of the table I explain what is calculated in each row of the table.

	Units	MMS	Salt	H2O	Citric Acid	Citric Acid	Citric Acid	Citric Acid	Lemon Juice	Vinegar	Tartaric Acid	Tartaric Acid	HCl
Molar Weight	g/mol	90.5	58.443	18.02	210.14	210.14	210.14	210.14	210.14	60.05	150.09	150.09	36.46
Density	g/cm ³	2.5	2.165	1	1.665	1.665	1.665	1.665	1.665	1.049	1.76	1.76	1.18
Valence		1			3	3	3	3	3	1	1	1	1
Concentration by Volume%	%cm ³ /cm ³				50.0%	10.0%							
Concentration by Weight%	%g/g	22.4%	5.6%	72.0%			50.0%	10.0%	6.0%	6.0%	6.0%	50.0%	8.0%
Density of Solution	g/cm ³	1.20					1.25	1.04	1.02	1.00	1.03	1.28	1.01
Volume per g Solution	cm ³ /g	0.84					0.80	0.96	0.98	1.00	0.97	0.78	0.99
Molarity	mol/L	2.96			3.96	0.79	2.97	0.50	0.29	1.00	0.41	4.25	2.22
Molarity * Valence	mol/L	2.96			11.88	2.38	8.92	1.49	0.88	1.00	0.41	4.25	2.22
Drops		1			0.2	1.2	0.3	2.0	3.4	3.0	7.2	0.7	1.3
Drops		2			0.5	2.5	0.7	4.0	6.8	5.9	14.4	1.4	2.7
Drops		3			0.7	3.7	1.0	6.0	10.1	8.9	21.7	2.1	4.0
Drops		4			1.0	5.0	1.3	8.0	13.5	11.8	28.9	2.8	5.3
Drops		5			1.2	6.2	1.7	10.0	16.9	14.8	36.1	3.5	6.7
Drops		6			1.5	7.5	2.0	12.0	20.3	17.7	43.3	4.2	8.0
Drops		7			1.7	8.7	2.3	13.9	23.6	20.7	50.5	4.9	9.3
Drops		8			2.0	10.0	2.7	15.9	27.0	23.7	57.8	5.6	10.7
Drops		9			2.2	11.2	3.0	17.9	30.4	26.6	65.0	6.3	12.0
Drops		10			2.5	12.5	3.3	19.9	33.8	29.6	72.2	7.0	13.3
Drops		11			2.7	13.7	3.7	21.9	37.1	32.5	79.4	7.7	14.7
Drops		12			3.0	15.0	4.0	23.9	40.5	35.5	86.6	8.4	16.0
Drops		13			3.2	16.2	4.3	25.9	43.9	38.4	93.8	9.1	17.3
Drops		14			3.5	17.4	4.7	27.9	47.3	41.4	101.1	9.8	18.7
Drops		15			3.7	18.7	5.0	29.9	50.6	44.4	108.3	10.5	20.0

Number of drops in orange column are for citric acid solutions that are prepared with concentration by volume. If in doubt: contact your vendor! Please round the numbers of drops up to the nearest integer!

Please note the importance of the valence in the resulting number of drops!

Concentration by Weight Percentage = Weight of (single) Solute / (Weight of (all) Solute(s) + Weight of Solvent)*100%

Concentration by Volume Percentage = Volume of (single) Solute / (Volume of (all) Solute(s) + Volume of Solvent)*100%

Density of Solution = 1/(Concentration_1/Density_1 + Concentration_2/Density_2 + ...) - formula used only for solutions mixed by weight

Volume per Gram of Solution = 1/Density of Solution - formula used only for solutions mixed by weight

Molarity = 1000 cm³/L*Concentration/(Volume per Solution*Molar Weight) - formula used only for solutions mixed by weight

Molarity = 1000 cm³/L*Concentration*Density/Molar Weight - formula used only for solutions mixed by volume

Molarity*Valence = Molarity * Valence

Number of Drops = 1 through 15 for MMS, (Molarity*Valence of MMS) / (Molarity*Valence of Acid) for the activators (acids)