

THC by LCMSMS
Uncertainty of Measurement Summary Budget

Source of Uncertainty	Description	Type A or B		Probability Distribution	Divisor	c _i	u _i (±)
Reproducibility u(r)	Experimental uncertainty arising from random effects measured from reproducibility of LCMSMS THC controls (3 levels); pooled relative standard deviations	Type A	0.0572	Normal (n=1218)	1	1	0.0572
Linear Least-Squares Regression u(cur)	Linear regression for Least Squares calibration curve results from pooled whole blood replicates 5.0 ng/mL from bias evaluation (n=30) analyzed under repeatability conditions on three instruments	Type A	0.0363	Normal (n=30)	1	1	0.0363
Systematic Error Recovery u(R_m)	Uncertainty associated with the evaluation of systematic error using bias evaluation replicate (5.0 ng/mL) data (n=30)	Type A	0.0340	Normal (n=30)	1	1	0.0340
Reference Materials u(Ctl)	Working control standard preparation; accounting for certified concentration of CRM, pipeting of CRM, density tolerance of MeOH, total volume, flask tolerance and repeatability	Type B	0.0222	Normal	1	1	0.0222
Reference Materials u(Cal)	Working standard preparation; accounting for certified concentration of CRM, pipeting of CRM, density tolerance of MeOH, total volume, flask tolerance and repeatability	Type B	0.0222	Normal	1	1	0.0222
Certified Reference Materials u(CRM)	Manufacturer uncertainty for THC CRM reported at 95.45% level k=2	Type B	0.0500	Normal	2	1	0.0250
Sample Preparation u(SP)	Pipette precision (maximum allowable imprecision)	Type B	0.0200	Rectangular	√3	1	0.0115

*RSD _{Pooled}	0.0572
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$$RSD_{pooled} = \sqrt{\{[(n_1-1) \times (RSD_1)^2] + [(n_2-1) \times (RSD_2)^2] + [(n_3-1) \times (RSD_3)^2]\} \div [(n_1+n_2+n_3) - 3]}$$

(%)	
Combined Standard Uncertainty (u _{comb})	8.65%
Expanded Uncertainty (U)	17.30% k=2, 95.4% Confidence Level
Expanded Uncertainty (U)	25.96% k=3, 99.7% Confidence Level

$$u_{comb} = \sqrt{u(r)^2 + u(cur)^2 + u(R_m)^2 + u(CRM)^2 + u(Ctl)^2 + u(Cal)^2 + u(SP)^2}$$

$$U = u_{comb} \times k$$