Patulin (Standard solution)

Order-No: CH-06-L1-100
Lot: xxxx xxxx xxxx xxxx
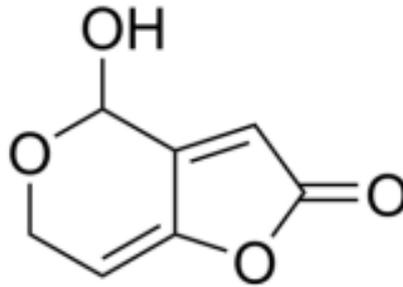
Analyte: Patulin (PAT)

Specification:

Substance:	Patulin
Source:	*Penicillium expansum*
Empirical Formula:	$C_7H_6O_4$
Melting point:	105 - 111°C
Molecular Weight:	154.12 g/mol
Concentration:	100 µg/mL
Volume:	1 ml
Diluted in:	Acetonitrile
CAS-No.:	Patulin: 149-29-1, Acetonitrile: 75-05-8
Storage conditions:	-20 °C, protected from light
Expiry date:	1 year after delivery
Certification:	The calibrant is certified on the basis of gravimetric preparation. Values are based on weight amount and purity.
	Uncertainty < 1.6 µg/ml in accordance with ISO Guide 31, ISO Guide 35 and Eurachem/CITAG Guides.

Calculation of uncertainty:

Uncertainty components	Description	Standard uncertainty (u)	
Purity (P) of solid Patulin	P = 98.0%	u(P) = 0.4%	a
Weighing procedure weighted sample: m_{ws} = 5 mg	repeatability: 0.03 mg linearity: 0.01 mg	u(m) = 0.03 mg	b
Dilution procedure Performed by volume V_f = 49 ml	calibration: 10 mL ± 0.01 ml repeatability: 0.01 ml volume expansion solvent	u(cal) = 0.1 ml u(rep) = 0.1 ml u(Vol.exp.) = 0.09 ml u(V) = 0.14 ml	c d e f

[a] Maximum tolerance of purity (rectangular distribution) was divided by $\sqrt{3}$
[b] Estimation of this u-value is based upon the values for repeatability and linearity described in the user manual of the microbalance
[c] A triangular distribution (division by $\sqrt{6}$) was chosen for the calculation of u(cal)
[d] Based on a series of ten weigh experiments; the value was used directly as a standard deviation
[e] Based on the density of 0.7857 g/cm^3 at temperature T = 20°C and a maximum temperature variation of ± 3°C, of volume expansion, relative volume expansion coefficient of acetonitrile is 1370 * 10^{-6}/°C, volume expansion term (rectangular distribution) was divided by $\sqrt{3}$
[f] The three contributions are combined to give the $(V) = \sqrt{u(cal)^2 + u(rep)^2 + u(Vol.exp.)^2}$

Calculation of the combined uncertainty u_c and the expanded standard uncertainty U:

$$c_{toxin} = \frac{m_{ws} \times P}{V_f} = \frac{5\text{ mg} \times 0.98}{49\text{ ml}} = 0.1 mg/ml = 100\ \mu g/ml$$

$$\frac{u_c(c_{toxin})}{c_{toxin}} = \sqrt{\left[\frac{u(P)}{P}\right]^2 + \left[\frac{u(m)}{m_{ws}}\right]^2 + \left[\frac{u(V)}{V_f}\right]^2} = \sqrt{\left[\frac{0.4}{98}\right]^2 + \left[\frac{0.03}{5}\right]^2 + \left[\frac{0.14}{49}\right]^2} = 0.0078$$

$$u_c(c_{toxin}) = c_{toxin} \times 0.0078 = 100\ \mu g/ml \times 0.0078 = 0.78\ \mu g/ml$$

Calculation of expanded standard uncertainty U using a coverage factor k = 2

$$U(c_{toxin}) = u_c(c_{toxin}) \times 2 = 0.78\ \mu g/ml \times 2 = 1.6\ \mu g/ml$$

Danger

Contains: Patulin, Acetonitrile

Volume: 1 ml

H300
H315

P264

P301 + P310

Danger

Highly flammable liquid and vapour.
Fatal if swallowed.
Causes skin irritation.

Wash hands thoroughly after handling.
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Wear protective gloves/protective clothing/eye protection/face protection.
Wash hands thoroughly after handling.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.

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