Specification

Crystal violet (C.I. 42555) A0691

Synonym	Gentian violet, Hexamethylene pararoseaniline chloride, Methyl violet 10 B, Pyoctaninum coeruleum
Transition interval	pH 0.8 - 2.6 (yellow - blue violet)
Solubility (25°C)	16 g/L (H_2O)
Melting range	189 - 194°C
Formula	$C_{25}H_{30}ClN_3$
M	407.99 g/mol
CAS-No.:	548-62-9
HS-No.:	32041300
EC-No.:	208-953-6
Storage:	RT
LGK:	10 - 13
R:	22-40-41-50/53
S:	22-26-36/37/39-61
	harmful, irritant, dangerous for the environment
Class / PG:	9/III
UN-No.	UN3077
WGK:	3
Specification	
Assay (photometr.)	min. 85 %
$\lambda_{max.}$	580 - 595 nm
E 1 %/1 cm, $\lambda_{max.}$	2000 - 2450
Loss on drying (110°C)	max. 10 %

Literature

(1) Yang, Y.-I. *et al*. (2001) *Electrophoresis* **22**, 855-859 Counterion-dye staining method for DNA in agarose gels using crystal violet and methyl orange.

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Comment

The commonly used DNA staining method employing ethidium bromide (EtBr) has two major drawbacks: The DNA has to be illuminated with UV-light damaging the DNA and the laboratory personnel and it is a strong mutagen. Therefore, staining methods employing visible light and less hazardous dyes are preferable. Crystal violet (CV) has a positively charged ammonium ion and three aromatic rings, binding to the negatively charged phosphate backbone of DNA. The optimal concentration for staining DNA in agarose gels turned out to be 0.001 % in the pH range of 6 - 8. Staining for 30 minutes resulted in a detection limit of 16 ng DNA. Thus, CV staining is four times less sensitive than EtBr staining. Combination of CV with the negatively charged counterion-dye methyl orange (MO), having 2 aromatic rings and one negatively charged sulfonic group, sensitivity could be improved to 8 ng detection limit. Under identical conditions (see above), CV was applied at a concentration of 0.0025 % and MO of 0.0005 %, respectively. Stock solutions were made up each at 0.25 %.
Since both dyes are easily removed (destaining for 2 hours with 50 % ethanol, subsequently 1 hour equilibration with distilled water), DNA was successfully applied in PCR assays and clonig experiments (ref. 1).