



Starna scientific
'Setting the Standard'

Quality Assurance in the Analytical Laboratory

Spectrophotometer UV and Visible Absorbance Qualification

Potassium Dichromate Solution References



Purpose

This Reference Material can be used to qualify the absorbance scale and absorbance linearity, in the ultraviolet and visible regions of the spectrum (from 235 nm to 430nm) of spectrophotometers with spectral bandwidths of 2 nm or less. It is accepted for this purpose by most Pharmacopoeias and Standardisation Bodies.

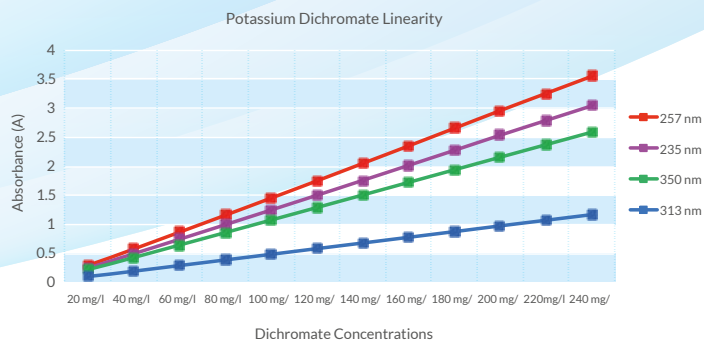
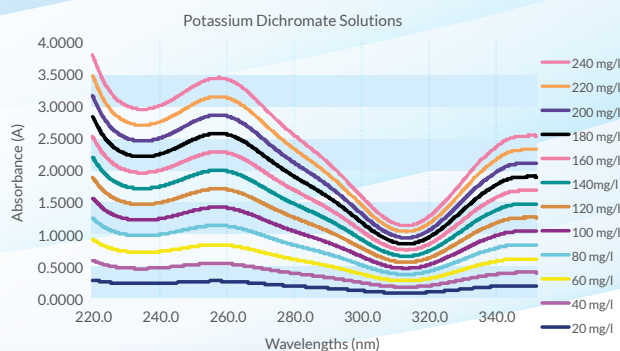
Principle and Discussion

Potassium dichromate in 0.001 M perchloric acid, permanently sealed by heat fusion into 10 mm UV-quality quartz cells. Solutions are prepared from solid potassium dichromate, NIST SRM 935a.

The use of potassium dichromate solvated in dilute perchloric acid is an established and well recognised method for the validation of the absorbance scale and linearity of a spectrophotometer in the UV region. When prepared in 0.001 M perchloric acid, potassium dichromate gives a spectral scan containing characteristic peaks at 257 nm and 350 nm, and troughs at 235 nm and 313 nm.

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Within the concentration range 0 - 240 mg/l, if the absorbance scale of a narrow SBW spectrophotometer is linear, the measured absorbances of a series of potassium dichromate concentrations will be a linear function of concentration.

When prepared at a 600 mg/l concentration, a potassium dichromate solution in 0.001 M perchloric acid can be certified at 430 nm for absorbance.

Typical absorbance values at the certified wavelengths for the different concentrations are:

Concentration	Nominal Absorbance Values at Certified Wavelengths				
	235 nm	257 nm	313 nm	350 nm	430 nm
20 mg/l	0.246	0.286	0.096	0.214	
40 mg/l	0.493	0.574	0.193	0.428	
60 mg/l	0.743	0.865	0.290	0.643	
80 mg/l	0.994	1.157	0.387	0.858	
100 mg/l	1.247	1.452	0.484	1.074	
120 mg/l	1.501	1.749	0.582	1.290	
140 mg/l	1.758	2.050	0.679	1.506	
160 mg/l	2.016	2.351	0.777	1.723	
180 mg/l	2.275	2.655	0.875	1.940	
200 mg/l	2.536	2.960	0.974	2.157	
220 mg/l	2.790	3.256	1.071	2.373	
240 mg/l	3.043	3.552	1.168	2.589	
600 mg/l					0.954

Note: The above values are for guidance only, as measured values will be spectral bandwidth dependent. The Calibration Certificate accompanying each Starna Potassium Dichromate Reference gives actual values measured at a bandwidth of 1.0 nm, and only the certified values should be used for instrument qualification. On request, Starna can provide certified values at other wavelengths and bandwidth values. To meet pharmacopoeia instrumental resolution requirements, the instrument to be qualified should have a spectral bandwidth of 2 nm or less.

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Certification and Documentation

A Certificate of Calibration and Traceability and full instructions for use are provided with each Reference Material. The certificate is supplied in electronic format, on a USB drive in the same box as the references, allowing hard copy to be produced on demand and giving easy interface to the user's own IT systems. Certification measurements are made on a reference spectrophotometer that has been qualified using Standard Reference Materials (SRMs) certified by the National Institute of Standards and Technology (NIST) in the USA, or against primary physical references such as elemental emission lines.

Warranty

STARNA offers a Lifetime Guarantee on all Starna Certified Reference Materials (CRMs), unless otherwise stated, such that any reference material that moves outside its published uncertainty budget will be replaced free of charge. This guarantee is subject to the reference materials being re-certified at least every two years and that the references have not been physically, thermally or optically abused. The STARNA UKAS accredited Calibration Laboratory aims to re-certify and despatch references within five working days from receipt.

Accreditation

Starna Scientific is accredited to both ISO 17034 as a Reference Material producer, and ISO/IEC 17025 as a Calibration Laboratory for optical reference measurements. Starna Scientific's manufacturing facility is accredited to the ISO 9001 Quality Management System with BSI. For details see www.starna.com/accreditations.

How to Order

Catalogue Identity: RM-nn where nn indicates the concentration of the solution. For example, **RM-02 is 20 mg/l, RM-04 is 40 mg/l, and so on up to RM-60, which is 600 mg/l.** References can be ordered separately or in any combination simply by combining these numbers: for example **RM-0204060810** would be a set comprising **20,40,60,80 and 100 mg/l** references.

For convenience, four sets covering different absorbance ranges are available. These are:

	CATALOGUE NUMBER
Potassium Dichromate Linearity Set, 0.09 to 1.5A 20, 40, 60, 80 & 100 mg/L & Blank Cell	RM-0204060810
As above, with additional 600mg/l reference for USP compliance	RM-020406081060
Potassium Dichromate Linearity Set, 1.5 to 3.5A 120, 140, 160, 180 & 220 & 240mg/l & Blank Cell	RM-121416182224
Potassium Dichromate Linearity Set, 0.19 to 3.5A 40, 80, 120, 160, 200 & 240 mg/l & Blank Cell	RM-040812162024

All individual references and sets are supplied with a perchloric acid blank cell.



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