

Technical Data Sheet

1.08160.0001

UV/VIS Standard 1 – Potassium dichromate solution for checking the absorbance of spectrophotometers, traceable to NIST

Application:

As absorbance is directly proportional to the concentration of the analyte under investigation wrong measurement of absorbance automatically produces wrong results. It is thus of the utmost importance to know the particular deviations of each photometer in this respect and to check these at regular intervals. Instruments of the same type also differ in these characteristics. As the deviations from the “true values” are not identical over the entire wavelength range, the spectrophotometer should thus be checked at the wavelength relevant to the sample to be measured.

Norms:

Ph. Eur. (Chapter 2.2.25): “Check the absorbance using suitable filters or a solution of potassium dichromate R at the wavelengths indicated in the Table, which gives for each wavelength the exact value and the permitted limits of the specific absorbance. The table is based on a tolerance for the absorbance of ± 0.01 .”

Wavelength (nm)	Specific absorbance A_1^1 per cent cm	Maximum Tolerance A_1^1 per cent cm	Absorbance
235	124.5	122.9 to 126.2	0,748 +/- 0,010 A
257	144.5	142.8 to 146.2	0,868 +/- 0,010 A
313	48.6	47.0 to 50.3	0,292 +/- 0,010 A
350	107.3	105.6 to 109.0	0,644 +/- 0,010 A

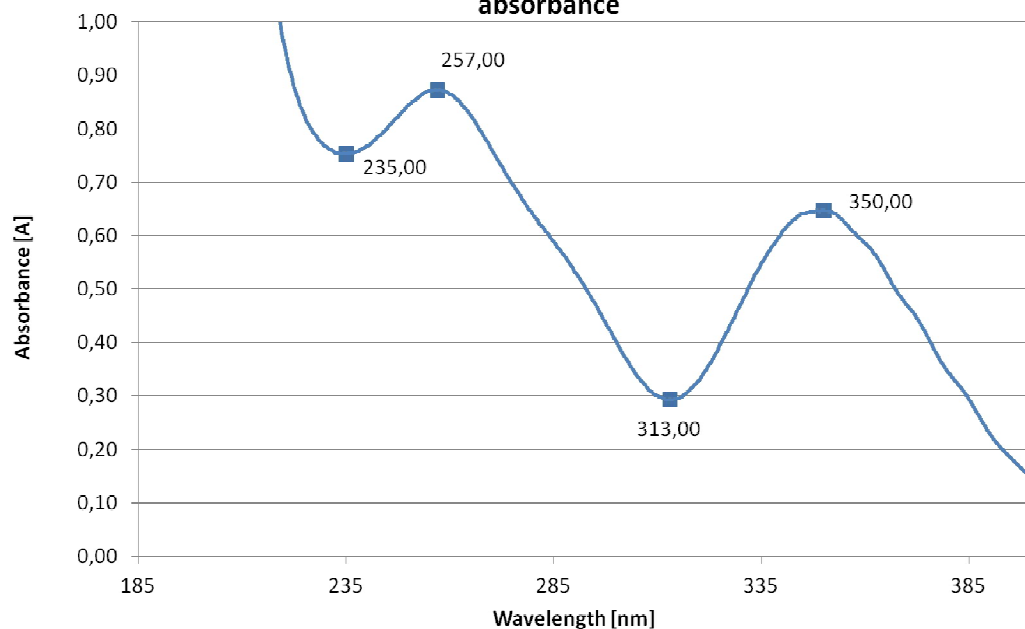
USP (851): “Detailed instructions for operating spectrophotometers are supplied by the manufacturers. To achieve significant and valid results, the operator of a spectrophotometer should be aware of its limitations and of potential sources of error and variation. The instruction manual should be followed closely on such matters as care, cleaning, and calibration of the instrument, and techniques of handling absorption cells, as well as instructions for operation. The following points require special emphasis.”

“For checking the photometric scale, a number of standard inorganic glass filters as well as standard solutions of known transmittance such as potassium dichromate are available. → Reference to NIST: For further detail regarding checks on photometric scale of a spectrophotometer, reference may be made to the following NIST publications: J. Res. Natl. Bur. Stds. 76A, 469 (1972) [re: SRM 931, “Liquid Absorbance Standards for Ultraviolet and Visible Spectrophotometry” as well as potassium chromate and potassium dichromate]”

ASTM (E 257): 17.4: “Photometric accuracy in the ultraviolet region can be determined using acidic potassium dichromate solutions. These can either be of high-purity compounds prepared by the user, potassium dichromate (NIST SRM 935 series), or commercially available sealed-cell format.”

JP XV (2.24): “the absorbance by a sample solution with a certain concentration is measured at the wavelength of the maximum absorption $\lambda_{\max}$ and compared it with the absorbance of a standard solution with a certain concentration.”

Instrument check: **Spectrum of a potassium dichromate solution for checking the absorbance**



Interpretation of results:

At specific wavelengths, potassium dichromate has characteristic maxima and minima. The absorption measured at these wavelengths must be within the tolerance range prescribed by the relevant pharmacopeias or instrument specifications. Should there be deviations, the analysis should first be checked and instrument service notified if necessary.