

Sample Specific Blank Value

Detecting and compensating for turbidity and colouration

During a photometric analysis, in addition to the compounds listed in the interferences table, turbidity and colouration can lead to false results. These errors come either from the sample itself or arise from reactions with the reagents. The influence of the turbidity and/or colouration can be determined by establishing the sample specific blank value.



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General Facts

What is a sample specific blank value?

During the analysis of a sample specific blank value, the sample is measured by omitting the colouring component in the cuvette test. The sample specific blank value describes the influence of the sample, independent of the concentration of the parameter to be determined, and is therefore subtracted from the analysis result. For cuvette tests not listed in the overview, the determination of a sample specific blank value is not necessary as the turbidity and colouration of the sample are already determined by the work process.

Working procedure

To establish a sample specific blank value, the work is performed precisely according to the instructions for the relevant cuvette test. The reaction time and temperature specifications for the relevant cuvette test must also be adhered to.

However, for the determination of the blank value, one or more components are replaced within a process step, as listed for the individual cuvette tests (see overview).

For tests with a Dosiscap Zip, the sealing foil is not removed. The cap is screwed on in its original condition.

For cuvette tests with sample preparation or digestion (Laton, Crack Set etc.), these must be performed first. Only then can the sample specific blank value from the pre-treated sample be prepared.

Measurement

The cuvette with the sample specific blank value is measured in the cuvette test mode (like the analysis cuvette). Exceptions are the measurements of blank value cuvettes with barcode readers and Lasa 100/50 (refer to special evaluations with blank value cuvettes). The result displayed in mg/L is the sample specific blank value.

Evaluation

Calculation of the result:

1. Analysis of the sample according to working procedure = A
2. Analysis of the sample specific blank value = B

Concentration of the sample = A – B

If the result of the sample specific blank value is below the measuring range, it can be ignored. In principle, the measurement results must be checked via a plausibility check (e.g. dilution).

Example:

Determining the nitrate nitrogen in a coloured sample:

1. Analysis of the sample = 10 mg/L
2. Analysis of the sample blank value = 0.5 mg/L

(The result of the sample blank value is within the measuring range for nitrate nitrogen: 0.23–13.5 mg/L).

Nitrate nitrogen content of the sample = 9.5 mg/L

Accessories

Blank value cuvettes: LCW 919

These can be ordered from Hach.

Overview of sample specific blank value

Test	Cuvette	Sample	Dist. water	Cap	Reagent A	Reagent B
LCK 049 Phosphate	Empty cuvette*	5.0 mL	1.0 mL	Red plug	—	—
LCW 053 Sulphide	Empty cuvette*	5.0 mL	—	Red plug	1.0 mL	—
LCK 138 Laton	Analysis cuvette	0.5 mL	0.2 mL	Original cap	—	—
LCK 153 Sulphate	Analysis cuvette	5.0 mL	—	Original cap	—	—
LCK 238 Laton	Analysis cuvette	0.5 mL	0.2 mL	Original cap	—	—
LCK 300 Alcohol	Analysis cuvette	0.2 mL	—	Original cap	—	—
LCK 301 Aluminium	Empty cuvette*	3.0 mL	—	Red plug	2.0 mL	1 spoon
LCK 302 Ammonium	Analysis cuvette	0.2 mL	—	Original cap	—	—
LCK 303 Ammonium	Analysis cuvette	0.2 mL	—	Original cap	—	—
LCK 304 Ammonium	Analysis cuvette	5.0 mL	—	Original cap	—	—
LCK 305 Ammonium	Analysis cuvette	0.5 mL	—	Original cap	—	—
LCK 307 Boron	Empty cuvette*	2.5 mL	—	Red plug	1.0 mL	—
LCK 310 Chlorine	Empty cuvette*	2.0 mL	—	Red plug	—	—
LCK 311 Chlorineide	Empty cuvette*	1.0 mL	5.1 mL	Red plug	—	—
LCK 313 Chrome	Analysis cuvette	2.0 mL	—	Original cap	—	—
LCK 315 Cyanide	Analysis cuvette	1.0 mL	1.0 mL	Original cap	—	—
LCK 321 Iron	Empty cuvette*	2.0 mL	—	Red plug	—	—
LCK 325 Formaldehyde	Analysis cuvette	1.0 mL	1.0 mL	Original cap	—	—
LCK 328 Potassium	Empty cuvette*	1.0 mL	5.0 mL	Red plug	—	—
LCK 329 Copper	Empty cuvette*	2.0 mL	—	Red plug	—	—
LCK 337 Nickel	Analysis cuvette	2.0 mL	0.2 mL	Red plug	—	—
LCK 338 Laton	Analysis cuvette	0.5 mL	0.2 mL	Original cap	—	—
LCK 339 Nitrate	Analysis cuvette	1.0 mL	0,2 mL	Original cap	—	—
LCK 340 Nitrate	Analysis cuvette	0.2 mL	1.0 mL	Original cap	—	—
LCK 341 Nitrite	Analysis cuvette	2.0 mL	—	Original cap	—	—
LCK 342 Nitrite	Analysis cuvette	0.2 mL	—	Original cap	—	—
LCK 345 Phenol	Empty cuvette*	2.0 mL	0.2 mL	Red plug	0.2 mL	0.2 mL
LCK 346 Phenol Measuring range I	Analysis cuvette	2.0 mL	0.4 mL	Original cap	—	—
LCK 346 Phenol Measuring range II	Analysis cuvette	0.4 mL	0.4 mL	Original cap	—	—
LCK 348 Phosphate	Analysis cuvette	0.5 mL	—	Original cap	—	0.2 mL
LCK 349 Phosphate	Analysis cuvette	2.0 mL	—	Original cap	—	0.2 mL
LCK 350 Phosphate	Analysis cuvette	0.4 mL	—	Original cap	—	0.5 mL
LCK 353 Sulphate	Empty cuvette*	2.0 mL	—	Red plug	—	—
LCK 354 Silver, dissolved	Analysis cuvette	5.0 mL	0.2 mL	Original cap	0.4 mL buffer	—
LCK 359 Tin	Analysis cuvette	1.0 mL	0.2 mL	Original cap	1.0 mL acid	—
LCK 360 Zinc	Please note! Separate work process. Please request application A122					
LCK 390 Aox	Please note! Separate work process. Please request application A61					
LCK 653 Sulphide	Analysis cuvette	4.0 mL	0.2 mL	Original cap	—	—
LCK 654 Sulphite	Analysis cuvette	5.0 mL	0.2 mL	Original cap	—	—

* Empty cuvette = blank value cuvette LCW 919

Special Evaluation Using Blank Value Cuvettes

Measurement with DRXXXX, Cadas, Isis and Xion

Cuvette tests:

LCK 049, 301, 307, 310, 311, 321, 328, 329, 345, 353

For the current Hach photometers (DR6000/5000/3900/3800/2800) or older Lange photometers such as Cadas (except Cadas 100), Isis and Xion, the measurement of the sample specific blank value is integrated directly into the measurement process. The measurement of the blank value must be performed immediately after the measurement of the sample. The photometer calculates the blank value automatically and displays the corrected end result.

Measurement with Lasa 100/50

For the measurement of the sample specific blank value with a blank value cuvette (LCW 919), the corresponding test must be copied into the test menu. An integrated measurement is not possible here.

