Supelco®

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Certificate of Analysis – Certified Reference Material

Certipur® Buffer solution pH 7.00 (20°C)

Certified Reference Material for pH measurement

Accredited as CRM Producer and Calibration Laboratory · ISO 17034 · DIN EN ISO/IEC 17025

Product no.:	1.09439.1000
Lot no.:	HC02388139
Description of CRM:	Certipur® Buffer solution pH 7.00 (20°C) Certified Reference Material for pH measurement
Expiry date:	2023/05/31
Storage:	+15°C to +25°C tightly closed in the original container
Composition:	di-sodium hydrogen phosphate / potassium dihydrogen phosphate

Certified value	Associated uncertainty, $U=k \cdot u$ ($k=2$)
pH value 7.00	**± 0.02 (20°C)**

Metrological traceability: The pH value of this certified buffer solution is directly traceable to primary certified reference materials characterised by PTB and verified by SRMs from NIST.
NIST 189c, 188, 185i, 186 Ig, 186 IIg, 187f
PTB OX-405/18, TA-442/19, PHT-340/16, PHO-346/16, BO-373/17
PTB: Physikalisch Technische Bundesanstalt, Braunschweig, Germany
NIST: National Institute of Standards and Technology, Gaithersburg, USA.

Measurement method: pH value is measured with a combined glass electrode after 5-point calibration according to DIN 19268 with reference buffer solutions according to DIN 19266, IUPAC, NIST, Ph.Eur. and USP.

Accreditation: Merck KGaA, Darmstadt, Germany is accredited by the German accreditation authority DAkkS as registered reference material producer D-RM-15185-01-00 in accordance with ISO 17034 and registered calibration laboratory D-K-15185-01-00 according to DIN EN ISO/IEC 17025.

Certificate issue date: 2020/05/26

APROVADO
Responsável: Wellington
Padrão: 5002A038PH
Data: 26/05/2020
Validade: 26/05/2023

DAkkS Deutsche Akkreditierungsstelle D-RM-15185-01-00 — **ISO 17034**

ilac-MRA DAkkS Deutsche Akkreditierungsstelle D-K-15185-01-00 — **ISO/IEC 17025**

CRM released by Approving Officer or delegate LS-OII-QS3

A. Yildirim

Dipl.-Ing. Ayfer Yildirim
(Responsible QC Laboratory Manager)
(Calibration Laboratory D-K-15185-01)

Merck KGaA, 64271 Darmstadt, Germany, Tel.: +49 (0)6151 72-2440
EMD Millipore Corporation, 400 Summit Drive Burlington MA 01803, USA, Tel. +1-978-715-4321
Sigma-Aldrich Canada Co. or Millipore (Canada) Ltd., 2149 Winston Park, Dr. Oakville, Ontario, L6H 6J8, Phone: +1 800-565-1400

Intended use:	This reference material is intended for use as a calibration standard for pH instruments or pH electrodes or as a control sample for measuring the pH value.
Instructions for handling and correct use:	The pH value is strongly dependent on the temperature. It is therefore necessary to keep the temperature constant within the measurement.
Health and safety information:	Please refer to the Safety Data Sheet for detailed information about the nature of any hazard and appropriate precautions to be taken.
Preparation:	This reference material is prepared gravimetrically from di-sodium hydrogen phosphate, potassium dihydrogen phosphate and high purity water.

Associated uncertainty:

The expanded uncertainty U_{CRM} is calculated as $U_{CRM} = k \cdot u_{CRM}$, where $k = 2$ is the coverage factor for a 95% coverage probability and u_{CRM} is the combined standard uncertainty in accordance to ISO 17034.

The combined uncertainty u_{CRM} is derived from combination of the squared uncertainty contributions:

$$u_{CRM} = \sqrt{u^2_{Characterisation} + u^2_{Homogeneity} + u^2_{Stability}}$$

$u_{characterisation}$:	is the uncertainty in accordance with DIN EN ISO/IEC 17025 which includes the contributions of the primary reference material and the measuring system.
$u_{homogeneity}$:	is the between-bottle variation in accordance with ISO 17034. The assessment of homogeneity is performed by analysis of a representative number of systematically chosen sample units.
$u_{stability}$:	is the uncertainty obtained from short-term and long-term stability in accordance with ISO 17034. The stability studies are the basis for the quantification of the expiry date of this reference material for the unopened bottle.

Informative values:

Temperature dependence[1]:

Temperature [°C]	Δ pH
0	+ 0.13
5	+ 0.07
10	+ 0.05
15	+ 0.02
20	± 0
25	- 0.02
30	- 0.02
35	- 0.04
40	- 0.05
50	- 0.05

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[1]Temperature deviation data provided for reference only. Values are not batch-specific and should not be considered certified values.

For more detailed information please read the certification report on our website.

Certificate of analysis revision history:

Certificate version	Date	Reason for version
01	2020/05/26	Initial version