



National Bureau of Standards

Certificate

Standard Reference Material 185e

Potassium Hydrogen Phthalate

pH Standard

E. S. Etz

This lot of potassium hydrogen phthalate ($\text{KHC}_8\text{H}_4\text{O}_4$) was prepared to insure high purity and uniformity. It meets the specifications of the American Chemical Society for reagent-grade material, but should not be considered to be entirely free of impurities such as traces of occluded water, free acid or alkali, chlorides, sulfur compounds, and heavy metals.

The pH(S) values listed below correspond to $\log(1/a_{\text{H}})$, where a_{H} is a conventional activity of the hydrogen (hydronium) ion referred to the standard state on the scale of molality. The values were derived from emf measurements of cells without liquid junction by the method of calculation described in the Journal of Research of the National Bureau of Standards 66A, 179 (1962). The uncertainty of the pH(S) of Standard Reference Material 185e is estimated not to exceed ± 0.005 unit for the 0 to 60 °C temperature range and ± 0.01 unit from 70 to 95 °C. (The certified values listed below apply only to SRM 185e.)

The 0.05-molal solution is recommended for the standardization of pH equipment. The pH(S) of this solution as a function of temperature is given below:

°C	pH(S)	°C	pH(S)	°C	pH(S)	°C	pH(S)
0	4.003	25	4.004	45	4.042	70	4.12
5	3.998	30	4.011	50	4.055	80	4.16
10	3.996	35	4.020	55	4.070	90	4.19
15	3.996	37	4.024	60	4.085	95	4.21
20	3.999	40	4.030				

The potassium hydrogen phthalate was obtained from the J. T. Baker Chemical Company of Phillipsburg, N. J.

The overall direction and coordination of the technical measurements leading to certification were performed under the chairmanship of R. A. Durst.

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The technical and support aspects involved in the preparation, certification, and issuance of this Standard Reference Material were coordinated through the Office of Standard Reference Materials by T. W. Mears.

Washington, D. C. 20234
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J. Paul Cali, Chief
Office of Standard Reference Materials

Directions for Use

Preparation of the 0.05-molal solution: Transfer 10.12 grams of SRM 185e to a 1-liter volumetric flask. Add distilled water to dissolve the salt and fill to the mark with distilled water at 25 °C. The distilled water should have a conductivity not greater than $2 \times 10^{-6} \text{ ohm}^{-1} \text{ cm}^{-1}$. Mix thoroughly by shaking. The salt should be dried for 2 hours at 110 °C before use.

The water used in the preparation of this pH buffer standard need not be protected from atmospheric carbon dioxide, and elaborate precautions for the exclusion of air from the solution are not necessary. The solution should, however, be protected against evaporation and contamination by molds. This standard buffer solution should be replaced at frequent intervals and when mold is apparent.