



CALBUF-2

Calcium Buffers

The free calcium concentration in CALBUF-2 is determined by the dissociation constants (K_d) of calcium ligand, the total calcium concentration and the total calcium ligand concentration. The K_d of the calcium in CALBUF-2 is pH sensitive. Therefore, changing pH will change the free calcium concentration. For the buffers of CALBUF-2 which have a pCa less than 6.30, every 0.01 pH unit shift will induce about 0.01 pCa unit shift. For the buffers which have a pCa greater than or equal to 6.30, every 0.01 pH unit shift will induce about 0.02 pCa unit shift. Since CO_2 in the air will slowly change the pH of the buffer solution, avoid leaving the bottle open to the air for long periods. If the buffer has been stored for a long time, the pH of the buffer solution should be checked and adjusted to the value indicated below.

Errors commonly induced in calculating

free calcium concentration (due to impurity of calcium ligand, misuse of proton activity and proton concentration, K_d changes in different ionic strength and pH) are all corrected.

Each calcium buffer contains 10 mM of a calcium ligand, 10 mM pH buffer, 150 mM K^+ , 135 mM Cl^- . Ionic strength is 0.15 M. The osmolarity of the solution is approximately 305 milliosmolar.

References:

- Harafuji, H. and Y. Ogawa (1980) *J. Biochem* **87**:1305-1312.
Miller, D. J. and G. L. Smith (1984) *Am. J. Physiol.* 246:C160-C166.
Sillen and Martell (1971) "Stability constants of metal-ion complexes, supplement No.1". Special Publication No. 25. The Chemical Society, London.
Thomas, M. V. "Techniques in calcium research". (1982) Academic Press.

[Ca ²⁺] (M)	pCa*	pH
1x10 ⁻⁸	8.00	7.82
4x10 ⁻⁸	7.40	7.52
1x10 ⁻⁷	7.00	7.31
2.5x10 ⁻⁷	6.60	7.11
5x10 ⁻⁷	6.30	8.03
7.5x10 ⁻⁷	6.12	7.86
1x10 ⁻⁶	6.00	7.73
4x10 ⁻⁶	5.40	7.13
1x10 ⁻⁵	5.00	6.75
4x10 ⁻⁵	4.40	7.84
1x10 ⁻⁴	4.00	7.44

*The pCa is defined as $-\log[\text{Ca}^{2+}]$, where $[\text{Ca}^{2+}]$ refers to free Ca^{2+} concentration in 0.15 M ionic strength at 20°C.



Warranty

WPI (World Precision Instruments, Inc.) warrants to the original purchaser that this equipment, including its components and parts, shall be free from defects in material and workmanship for a period of 30 days from the date of receipt. WPI's obligation under this warranty shall be limited to repair or replacement, at WPI's option, of the equipment or defective components or parts upon receipt thereof f.o.b. WPI, Sarasota, Florida U.S.A. Return of a repaired instrument shall be f.o.b. Sarasota.

The above warranty is contingent upon normal usage and does not cover products which have been modified without WPI's approval or which have been subjected to unusual physical or electrical stress or on which the original identification marks have been removed or altered. The above warranty will not apply if adjustment, repair or parts replacement is required because of accident, neglect, misuse, failure of electric power, air conditioning, humidity control, or causes other than normal and ordinary usage.

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Claims and Returns

- Inspect all shipments upon receipt. Missing cartons or obvious damage to cartons should be noted on the delivery receipt before signing. Concealed loss or damage should be reported at once to the carrier and an inspection requested. All claims for shortage or damage must be made within 10 days after receipt of shipment. Claims for lost shipments must be made within 30 days of invoice or other notification of shipment. Please save damaged or pilfered cartons until claim settles. In some instances, photographic documentation may be required. Some items are time sensitive; WPI assumes no extended warranty or any liability for use beyond the date specified on the container.

- WPI cannot be held responsible for items damaged in shipment en route to us. Please enclose merchandise in its original shipping container to avoid damage from handling. We recommend that you insure merchandise when shipping. The customer is responsible for paying shipping expenses including adequate insurance on all items returned.

- Do not return any goods to WPI without obtaining prior approval and instructions (RMA#) from our returns department. Goods returned unauthorized or by collect freight may be refused. The RMA# must be clearly displayed on the outside of the box, or the package will not be accepted. Please contact the RMA department for a request form.

- Goods returned for repair must be reasonably clean and free of hazardous materials.

- A handling fee is charged for goods returned for exchange or credit. This fee may add up to 25% of the sale price depending on the condition of the item. Goods ordered in error are also subject to the handling fee.

- Equipment which was built as a special order cannot be returned.

- Always refer to the RMA# when contacting WPI to obtain a status of your returned item.

- For any other issues regarding a claim or return, please contact the RMA department.

Warning: This product is not designed or intended for use on humans.

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