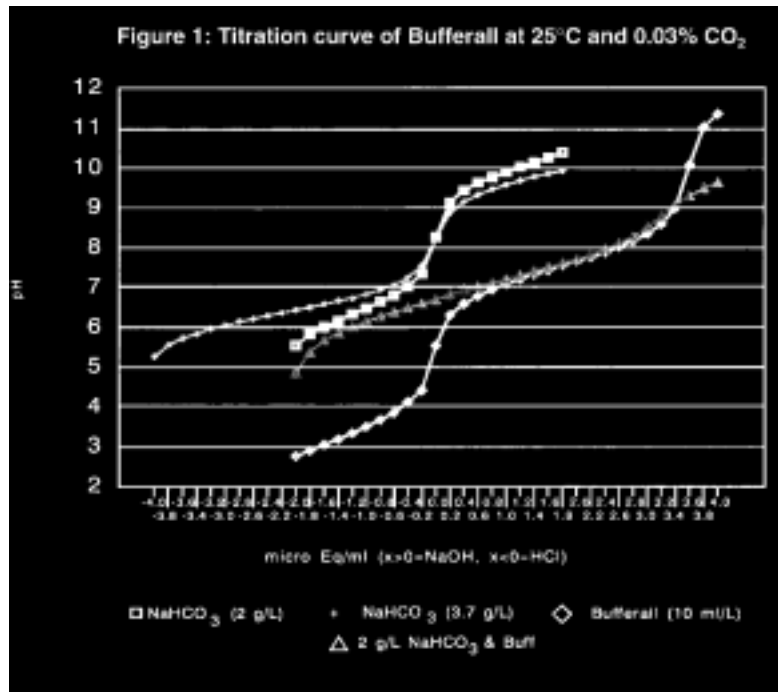


BUFFERALL
Product No. B 8405

Changes in the pH of media affect mammalian cell growth (1,2), while the optimal pH varies with each cell line (5). In an effort to maintain the pH of media within the biological range of 6 - 8, phosphate and carbonate buffers have been used. Drawbacks to using these buffers are: [1] wide pH fluctuations occurring in media buffered in this manner; [2] phosphate, which is involved in metabolism, precipitates cations; and [3] carbonate buffering

limited solubility.

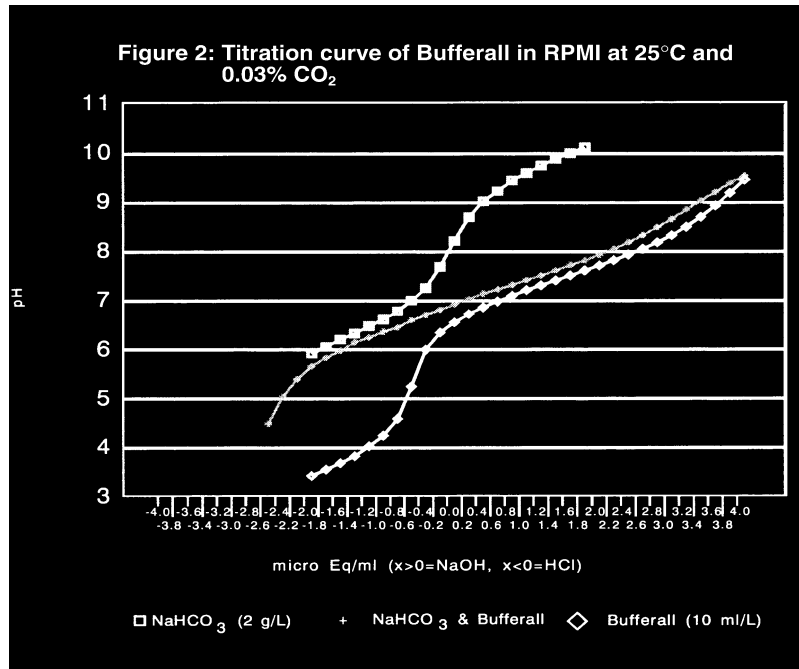
In 1966, Good and co-workers developed zwitterionic buffers which are chemically stable, with high solubility and do not penetrate cells (4). Good's buffers, as well as other organic buffers, cover the biological pH range. Each individual buffer is most effective approximately two pH units centered on the pK_a . Combinations of these biological buffers have been reported to reduce the wide pH fluctuations



depends on carbon dioxide, which has

observed in cell culture (3).

Sigma's Bufferall is a combination of three biological buffers with pK_a values of 7.2, 7.55 and 8.0. Bufferall is a general use buffer system effective in reducing pH fluctuations over the pH range 7.0 to 8.0. In comparison, the buffering capacity of Bufferall is markedly greater than that of carbonate (Fig. 1). The addition of Bufferall to media with or without carbonate greatly enhances buffering capacity within the



biological pH range (Fig. 2). In our laboratories, Bufferall did not adversely affect the growth of any cell line tested.

REFERENCES

1. Mackenzie, C. et al. (1961). *J. Biophys. Biochem. Cytol.* 9:141-156.
2. Taylor, A. (1962). *J. Cell Biol.* 15:201-209.
3. Eagle, H. (1971). *Science* 174:500-503.
4. Good, N. et al. (1966). *Biochem* 5:467.
5. Ceccarini, C. and Eagle, H. (1971). *Proc. Natl. Acad. Sci. USA* 68:299.