

pH & Buffers

Biology

The pH scale, and how biological systems resist change.

pH is the negative logarithm of hydrogen ion concentration.

$$\text{pH} = -\log_{10}[\text{H}^+]$$

pH 7 to pH 6

Ten times more H^+

pH 7 to pH 4

One thousand times more

Blood pH

7.35–7.45

Very tightly controlled.

THE COMMON MISTAKE

✗ **Treating pH as a linear scale**

✓ **It is logarithmic**

A shift from 7.4 to 7.0 sounds small and represents more than a doubling of hydrogen ion concentration — enough to be fatal.

The bicarbonate buffer system is the main blood buffer, and links directly to breathing rate through CO_2 .