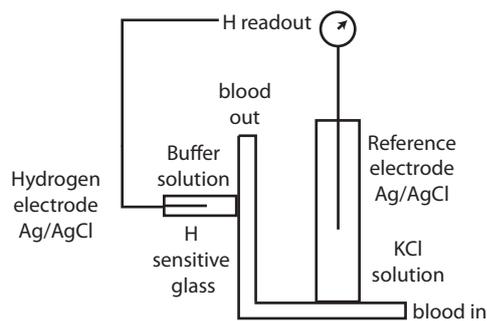


pH

is a measure of hydrogen ion activity in a liquid

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

therefore pH of 9 is equivalent to H ion concentration of 10^{-9} mol/litre (1 nmol/litre)
pH of 7.4 is equivalent to H ion concentration of $10^{-7.4}$ mol/litre (40 nmol/litre)
pH of 7 is equivalent to H ion concentration of 10^{-7} mol/litre (100 nmol/litre)



System is kept at 37 degrees

the potential difference between the reference electrode and the H electrode is measured and converted to a direct reading of H or pH

Measurement using a pH electrode

consists of 2 x half cells:

the glass electrode

reference electrode both connected via blood to make a complete circuit

Glass electrode:

Ag/AgCl core encased in glass.

[H⁺] within glass electrode kept constant by buffer solution.

Glass is in contact with blood

Reference electrode:

Ag/AgCl bathed in KCl (salt bridge)

doesn't participate in H-measurement.

Semi-permeable membrane separates it from blood

Requirements:

Standardisation of T°C (pH changes inversely with change T°C)

Regular calibration (x2 buffers of known pH (PO₄ buffers).