

وَقُلْ رَبِّ زِدْنِي عِلْمًا



RESPIRATORY SYSTEM

HAYAT BATCH



SUBJECT : Biochemistry

LEC NO. : 2

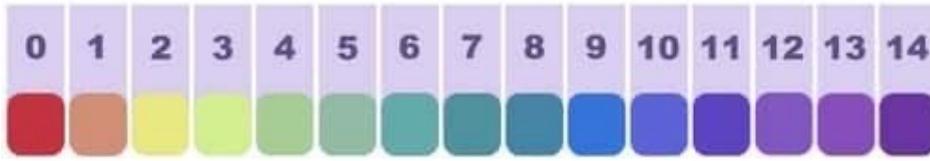
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Respiratory System

بالبدائية لازم نعرف قيمة ال Ph الطبيعية

pH scale



Ph range : 1-14

* Normal blood pH is kept within a very limited range (7.35 - 7.45)

- PH: 7.35 - 7.45 * جدول الأرقام حفظ
- PaCO₂: 35 - 45 mmHg → Arterial oxygen partial pressure
- PaO₂: 75 - 100 mmHg → Arterial carbon dioxide partial pressure
- HCO₃: 22 - 26 mmol/L → Bicarbonate

* It is very important to keep the pH around 7.4 which is suitable to the functions of most body enzymes

There are 3 lines of defenses (pH fighters) which regulate the pH :

- 1- blood buffer
- 2- respiratory regulation
- 3- renal regulation

* Buffers : are solutions that resist changes in their pH when moderate amounts of acids or bases are added

Buffers are of two types <
 weak acids and their salt with a strong base (H₂CO₃ / NaHCO₃)
 weak bases and their salt with a strong acid (NH₄OH / NH₄CL)

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Respiratory System

Types of buffer

Physiological

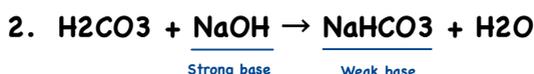
- Bicarbonate
- Phosphate
- Protein systems

Blood buffer

- Bicarbonate
- Phosphate
- Protein systems

1. In plasma includes : plasma proteins like albumin , globulins , and fibrinogen
2. In red blood cells : hemoglobin and oxyhemoglobin buffering system

Mechanism of action :



* normal plasma carbonic acid is 1.2 mmol / L

* the ratio between bicarbonate to carbonic acid is equal to 20:1

- Bicarbonate buffer system accounts for 65 % of buffering capacity in plasma and 40 % of buffering action in the whole body.
- Bicarbonate is regulated by the kidney (Metabolic component) while the carbonic acid is under respiratory regulation (Respiratory component).

* Bicarbonate represents the alkali reserve and it has to be sufficiently high to meet the acid load

* Buffers act quickly but not permanently because they do not serve to eliminate the acid from the body and unable to replenish the alkali reserve of the body

* For the final elimination of acids , the respiratory and renal regulations are very essential

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