

ELECTRIC FOUNDATION OF LIVING ORGANISMS

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ABSTRACT: In the blood, as in fact throughout the body, there is a surplus of negative electric charges, which leads to the idea that the body, at a deeper level, hidden material support, there is a plasma state. It should therefore be calculated electric potential manifested in the existence of such states.

KEY WORDS: electric, Avogadro, dissociation, aqueous solution

1. INTRODUCTION

Through direct measurements it can be shown that human blood has a pH value between 7.30 and 7.42. This means that in the blood, as in fact throughout the body, there is a surplus of negative electric charges, which leads to the idea that the body, at a deeper level, hidden material support, there is a plasma state. It should therefore be calculated electric potential manifested in the existence of such states. In addition, the existence of such potential is a strong argument in favor of "electrical operation" of any living beings.

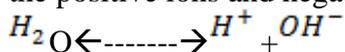
2. PRELIMINARY NOTIONS

1. Avogadro's Number, N_A

$$N_A = 6,023 \cdot 10^{23} \text{ molecule/mol, mol}^{-1}$$

2. Water ionization

The water molecules are in equilibrium with the positive ions and negative ions OH^- :



Equilibrium constant (dissociation) water is written as:

$$K_W = [H^+] \cdot [OH^-]$$

and it was shown experimentally that:

$$[H^+] = [OH^-] = 10^{-7}$$

from which :

$$K_W = [10^{-7}] \cdot [10^{-7}] = 10^{-14}$$

Note that in aqueous solutions exist simultaneously both types of ions, so both types of electrical charges, observing the equation that defines the equilibrium constant.

Notions pH, pOH, K_W are defined as follows:

$$pH = -\log [H^+]$$

$$pOH = -\log [OH^-]$$

$$p^{K_W} = -\log [K_W]$$

Important: Units of measure, are expressed in [ion moles / liter solution] (and also notes with M).

Example calculation

$$\text{A solution has } H^+ = 10^{-4} \text{ M}$$

$$\Rightarrow pH = -\log [H^+] = -\log [10^{-4}] = 4 \\ \Rightarrow pH = 4$$

$$\Rightarrow pOH = K_W - pH = 14 - 4 = 10 \Rightarrow \\ pOH = 10$$

$$\Rightarrow [OH^-] = 10^{-10} \text{ M}$$

And vice versa :

$$\text{A solution of } pH = 4 \text{ containing: } 10^{-4} \text{ M ioni } H^+ \\ \text{si } 10^{-10} \text{ M ioni } OH^-$$

1. Physical quantities for the physiology of blood

□ circulate throughout the body about 5.5 liters of blood which is 1/13 - 1/14 of an adult body mass of 55-70 kg.

□ blood pH values between 7.30 and 7.42 have.

□ blood viscosity has values of 4.7 in men and 4.4 in women, relative viscosity value of water, considered one.

□ sperm density has a value of 1061 kg / 1057 kg in men and / women.

All these sizes can occur from causes normal physiological variations, or variations due to pathological causes.

3. FUNDAMENTALS OF PLASMA PHYSICS

Plasma is represented as a homogeneous mixture of neutral particles, particles and electrically charged quanta of electromagnetic radiation. Whole electric system cvasineutru appears as positive charge carrier concentration is equal to the negatively charged particles. Cvasineutralitate accidental deviations from intense electric fields are canceled domestic.

Ex: Suppose that in a volume of radius r there is a deviation from cvasineutralitate due to a surplus of negative electric charge .It will generate a strong electric field, whose manner is calculated as follows:

$$|\vec{E}| = \frac{Q}{4\pi\epsilon_0 \cdot r^2} \text{ and a negative electric potential value } V = \frac{Q}{4\pi\epsilon_0 \cdot r}$$

$$\text{So: } |\vec{E}| = \frac{Q}{4\pi\epsilon_0 \cdot r^2} = \frac{4}{3\pi r^2} \frac{e(N_- + N_+)}{4\pi\epsilon_0} \cdot \frac{1}{r^2} = \frac{e \cdot \Delta N}{3\epsilon_0 \cdot r}$$

$$\text{Or: } |\vec{E}| = \frac{e \cdot N}{3\epsilon_0 \cdot N} \cdot \frac{\Delta N}{N}$$

in which:

$$\Delta N = N_- - N_+$$

- Deviation from cvasineutralitate

$$\left[\frac{\text{particule}}{m^3} \right] \frac{\Delta N}{N}$$

- Relative deviation from cvasineutralitate [%]

$$N = N_+ + N_-$$

: cvasineutralitatea average particle electric charge, [particles/ m^3]

$$\text{And so: } V = \frac{e \cdot \Delta N}{3\epsilon_0 \cdot N} \cdot r^2$$

$$\text{Or: } V = \frac{e \cdot N}{3\epsilon_0 \cdot N} \cdot \frac{\Delta N}{N} \cdot r^2$$

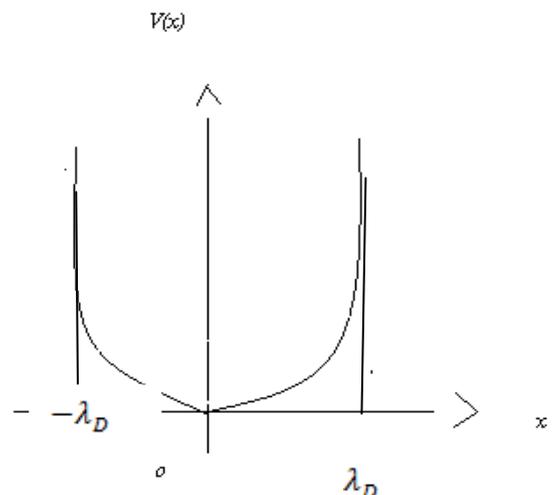
Spatial deviation from cvasineutralitate Debye screening length,: is the distance by which the potential plasma generated by a particle formation of a certain sign, can act on particles of opposite sign. We consider that cvasineutralitate deviation from the plan is the emergence of a parallel layer of negative charge. The potential V (x) generated by the task layer will be described by Poisson equation of the form (dimensional case):

$$\frac{d^2 V}{dx^2} = \frac{\rho_-}{\epsilon_0} = \frac{e \cdot N_-}{\epsilon_0}$$

A solution is an algebraic equation of order 2 without free term:

$$V(x) = \frac{1}{2} \frac{e N_-}{\epsilon_0} \cdot x^2$$

Graphical representation of algebraic equation is a parable pointing coordinate origin of the grid, the system of coordinates (x, V (x)) called pit potential.



Asymptotes Ox axis intersects the parabola in points marked and points representing the distance to the potential $V(x)$ can be felt its action on other electrical loads. In hated calculations involving elements of Boltzmann statistics, give value:

$$\lambda_D^- = \sqrt{\frac{\epsilon_0 K T_-}{e^2 N_-}}$$

In witch $K = \frac{R}{N_A}$, Boltzmann's constant and linking energy in particle observed in the mass and temperature: $K = 1,3806504 \cdot 10^{-23} \text{ J} \cdot \text{K}^{-1}$

$R = 8,314 \text{ J} \cdot \text{K}^{-1} \cdot \text{mol}^{-1}$ - constanta gazelor perfecte.

Theoretical reasoning

It all started from empirical observations, apparently separate, but with a common cause:

□ sanitariums (prventoriile) TB were located only in places where air,, good " help cure patients. It was found in the 60s that in those places the oxygen concentration of negative ions exceeds 2,000 ions $/./\text{cm}^3$.

In the 80s of the last century it found that ionized alkaline water (pH = 9 to 11) energizes the body.

□ In all the diets recommended for loose bodies insist on eating raw vegetables that are alkaline.

The common element in all these cases is the fact now reflected in the additional electrical load and to compound. Moreover, although blood is alkaline, pH = 7,3 – 7,42.

Because blood carries oxygen, carbon dioxide and complex substances throughout the body, we refer to it. The blood contains electrically positive and negative ions of water, which leads to the conclusion that these ions can be equated with a pathological plasma disguised liquid state. Generating such, potential and electric fields generated by the electric charge density.

We believe that the blood pH has an average value:

pH = 7,36

which means that there is a concentration in the blood:

$$\begin{aligned} &\text{> } 10^{-7,36} \text{ M ioni } H^+ \\ &\text{> } 10^{-6,64} \text{ M ioni } OH^- \end{aligned}$$

Or :

$$\begin{aligned} &\text{> } 10^{-7,36} \text{ ion mole } H^+ / \text{l aqueous solution} \\ &\text{> } 10^{-6,64} \text{ ion mole } OH^- / \text{l aqueous solution} \end{aligned}$$

And using the value of Avogadro's number, blood contains:

$$\begin{aligned} &\text{> } 10^{-7,36} \cdot N_A \text{ ion } H^+ / \text{l aqueous solution} \\ &\text{> } 10^{-6,64} \cdot N_A \text{ ion } OH^- / \text{l aqueous solution} \end{aligned}$$

Or : $N_A = 6,023 \cdot 10^{23}$ molecules /mole

$$\Rightarrow 6,023 \cdot 10^{15,64} \text{ ion/l aqueous solution} = N_H$$

$$6,023 \cdot 10^{16,36} \text{ ion } OH^- / \text{l aqueous solution} = N_{OH}$$

And also: $1 \text{ l} = 1 \text{ dm}^3 = 10^{-3} \text{ m}^3$

from which: $N_H = 6,023 \cdot 10^{15,64} \frac{\text{ioni } H^+}{10^{-3} \text{ m}^3 \text{ sol}}$

$$= 6,023 \cdot 10^{18,64} \frac{\text{ioni } H^+}{\text{m}^3} \text{ sol}$$

$$N_{OH} = 6,023 \cdot 10^{16,36} \frac{\text{ioni } OH^-}{10^{-3} \text{ m}^3} \text{ sol}$$

$$= 6,023 \cdot 10^{19,36} \frac{\text{ioni } OH^-}{\text{m}^3} \text{ sol}$$

In this phase densities are positive and negative respectively.

So blood there is a surplus negative charge density:

$$N_- = N_{OH^-} - N_{H^+} = 6,023 (10^{19,36} - 10^{18,64}) \text{ m}^{-3}$$

With this value can be calculated Debye screening length, λ_D :

$$\lambda_D = \left(\frac{\epsilon_0 K T_-}{e^2 N_-} \right)^{\frac{1}{2}} = \frac{8,856 \cdot 10^{-12} \cdot 1,38 \cdot 10^{-23} \cdot 310}{\left((1,6 \cdot 10^{-19})^2 \cdot 6,023 (10^{19,36} - 10^{18,64}) \right)^{\frac{1}{2}}}$$

$$= \frac{8,856 \cdot 1,38 \cdot 310 \cdot 10^{-35} \cdot 10^3 \cdot 10^{15}}{(1,6^2 \cdot 10^{-35} \cdot 6,023 \cdot 10^{18,64} (10^{0,75} - 1))^2} \cdot \frac{1}{2}$$

$$= \left(\frac{3788,5968 \cdot 10^{-15}}{15,41888} \right)^{\frac{1}{2}} \approx 50 \cdot 10^{-7} \text{ m}$$

Negative electric potential generated by a sphere of radius will be equal to:

$$V = \frac{e \cdot \Delta N}{3 \epsilon_0 \cdot r^2} =$$

$$= \frac{1,6 \cdot 10^{-19} \cdot 6,023 \cdot 10^{18} (10^{1,36} - 10^{0,64})}{3 \cdot 8,856 \cdot 10^{-12}} (49,57 \cdot 10^{-7})^2 =$$

$$= \frac{1,6 \cdot 6,023 \cdot 10^{-1} \cdot 10^{12}}{3 \cdot 8,8656} \cdot 50^2 \cdot 10^{-14} \approx 18 \text{ V}$$

3. CONCLUSIONS

It can be said that the breast there is a potential negative electric tens of volts in this case is confirmed as accurate empirical observations regarding the use of negative ions of oxygen and water ionized alkaline because food everyday involve food intake mainly acid. This negative potential of such a body becomes positive argument in favor Kirilian photo. Its value is still a small positive argument for using ultra-high tensions in this type of photography. The existence of electric potential is therefore a strong argument in favor of "electrical operation" of any living organism.

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