THE LAWS OF THERMOBIOCHEMISTRY

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In this article I give the Laws of Thermobiochemistry which unify the Theory of Biology, Chemistry and Physics

First Law of Thermobiochemistry: In an isolated Thermobiochemical System the variations of Energy tend to zero as time elapses

$$dU \to 0 \text{ as } t \to \infty$$

where U is the Energy of the Thermobiochemical System and t the time elapsed on the Thermobiochemical System

Second Law of Thermobiochemistry: In a Thermobiochemical System the Energy is conserved

$$\frac{dU}{U} = \frac{dQ+dW+dE+dmc^2+\gamma dA}{Q+W+E+mc^2+\gamma A}$$

where U is the Energy, Q the Heat, W the Mechanical Energy, E the Electromagnetic Energy, mc^2 the Mass Energy and γA the Surface Tension of the Thermobiochemical System

Third Law of Thermobiochemistry: In a Thermobiochemical System the sum of the variations of Thermomechanical Energy and Biochemical Kinetic Energy is the sum of the variations of Heat and Surface Tension

$$\frac{dPV+dBK}{PV+BK} = \frac{dQ+\gamma dA}{Q+\gamma A}$$

where PV is the Thermomechanical Energy, BK the Biochemical Kinetic Energy, Q the Heat and γA the Surface Tension of the Thermobiochemical System

Fourth Law of Thermobiochemistry: In a Thermobiochemical System the Biochemical Kinetic Energy tends zero as Heat tend to zero

$$BK \to 0 \text{ as } Q \to 0$$

where BK is the Biochemical Kinetic Energy and Q the Heat of the Thermobiochemical System

Fifth Law of Thermobiochemistry: In a Thermobiochemical System the variations of Entropy are the variations of Heat minus the variations of Mass Energy by Heat average

$$\frac{dS}{S} = \frac{dQ-\sum n_{ij} d\xi_i c^2}{\frac{Q-mc^2}{Q_{avg}}}$$

where S is the Entropy, Q the Heat, mc^2 the Mass Energy, n_{ij} the Stoichiometric Coefficients and ξ_i the Extents of Reaction of the Biochemical Reactions of the Thermobiochemical System

Sixth Law of Thermobiochemistry: In a Thermobiochemical System the variations of Entropy due to irreversible Thermobiochemical Processes are always positive

$$dS_i \geq 0$$

where S_i is the Entropy due to the irreversible Thermobiochemical Processes of the Thermobiochemical System

Seventh Law of Thermobiochemistry: In a Thermobiochemical System the Entropy tends to zero as Heat tends to zero

$$S \to 0 \text{ as } Q \to 0$$

Eigth Law of Thermobiochemistry "Law of Life": In a Thermobiochemical System the sum of the variations of Organic Chemical Potential and the variations of the Biochemical Kinetic Energy are the variations of Life

$$\frac{dBP+dBK}{BP+BK} = \frac{dL}{L}$$

where BP is the Organic Chemical Potential, BK the Biochemical Kinetic Energy and L the Life of the Thermobiochemical System

Ninth Law of Thermobiochemistry "Law of Health": In a Thermobiochemical System the sum of the variations of Organic Chemical Potential, Organic Chemical Energy and Biochemical Kinetic Energy is the variation of Health

$$\frac{dBP+dBC+dBK}{BP+BC+BK} = \frac{dH}{H}$$

where BP is the Organic Chemical Potential, BC the Organic Chemical Energy, BK the Biochemical Kinetic Energy and H the Health of the Thermobiochemical System

Tenth Law of Thermobiochemistry "Law of Evolution": In a Thermobiochemical System the sum of the variations of Organic Chemical Potential and Organic Chemical Energy is the variation of Evolution

$$\frac{dBP+dBC}{BP+BC} = \frac{dE}{E}$$

where BP is the Organic Chemical Potential, BC the Organic Chemical Energy and E the Evolution of the Thermobiochemical System

Eleventh Law of Thermobiochemisty: In a Thermobiochemical System the Organic Chemical Potential tends to zero as the Biochemical Kinetic Energy tends to zero

$$BP \to 0 \text{ as } BK \to 0$$

where BP is the Organic Chemical Potential and BK the Biochemical Kinetic Energy of the Thermochemical System

Twelfth Law of Thermochemistry: In a Thermobiochemical System the Organic Chemical Energy tends to zero as the Biochemical Kinetic Energy tends to zero

$$BC \to 0 \text{ as } BK \to 0$$

where BC is the Organic Chemical Energy and BK the Biochemical Kinetic Energy of the Thermobiochemical System

As a consequence as the Biochemical Kinetic Energy tends to zero the Thermobiochemical System comes to extinction

References

1. Cordero Grau, Daniel. The Laws of Thermochemistry.