Gladyshev, J Thermodyn Catal 2017, 8:2
DOI: 10.4172/2157-7544.1000188

Journal of Thermodynamics & Catalysis

Commentary Open Access

Life - A Complex Spontaneous Process Takes Place against the Background of Non-Spontaneous Processes Initiated by the Environment

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Abstract

The author believes that hierarchical thermodynamics is the foundation of extended Darwinism. To the extent of its applicability, hierarchical thermodynamics cannot be refuted.

Keywords: Hierarchical thermodynamics; Evolution; Life; Origin of life; Aging; Principle of substance stability

Introduction

Modern hierarchical thermodynamics explains the phenomenon of life and makes some predictions. The evolution of living beings is associated with directed and random processes. Directed spontaneous processes take place within the quasi-closed living systems. Random or non-spontaneous processes are initiated by the environment and proceed also in these systems. In general, spontaneous evolutionary processes in living systems occur against a background of periodic and / or unpredictable changes in the environment, which (changes) are however compatible with life. When the role of non-spontaneous processes is relatively small, the tendency of the spontaneous processes directed by the second law is manifested. This tendency is manifested in the long stages of biological evolution in the absence of revolutionary changes in the environment (volcanic eruptions, the fall of meteorites and similar phenomena). The presented considerations are applicable to phylogenies and ontogeny (aging of living beings). My thermodynamic theory may be agreed with the representations of the theory of punctuated equilibria of Stephen Jay Gould and his colleague Niles Eldredge.

The simultaneous participation of spontaneous and unpredictable non-spontaneous processes in evolution makes it difficult to understand evolutionary transformations from the standpoint of general evolutionary biology and leads to ideas about intelligent design for explaining the origin of life and its evolution. These circumstances also lead to the fact that Some scientists would like to create the new theory of biological evolution.

Many scientists believe that the general laws of nature explain the origin of life, its evolution. The general laws of nature include conservation laws, the second law of thermodynamics, and also the statistical law. In addition, the general laws include the law of temporary hierarchies and the principle of substance stability. We are not knowing why these laws exist in nature and determine the development of our universe. At this stage of understanding our world, some people come to the idea about the Creator. Some scientists consider that the Creator to be the very nature. The author of this note thinks that the origin of life and its evolution does not require the intervention of intellectual design, since in this case, general laws of nature are sufficient to explain these phenomena.

Conclusion

To the extent of its applicability, thermodynamics rules everything that happens in our world.

The author believes that hierarchical thermodynamics is the foundation of extended Darwinism. Information on the thermodynamic theory of biological evolution is available in scientific journals of open access [1-3].

References

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Received June 21, 2017; **Accepted** July 14, 2017; **Published** July 21, 2017

Citation: Gladyshev GP (2017) Life - A Complex Spontaneous Process Takes Place against the Background of Non-Spontaneous Processes Initiated by the Environment. J Thermodyn Catal 8: 188. doi: 10.4179/2157-7544.1000188

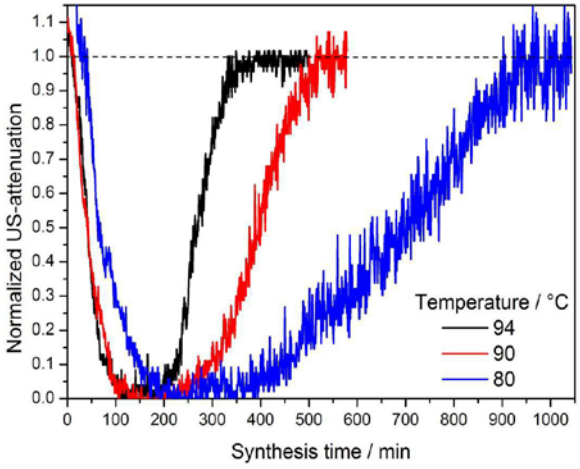

Figure 1: Progress of attenuation of ultrasound during synthesis of zeolite X at different temperatures (Hums et al. [31]).

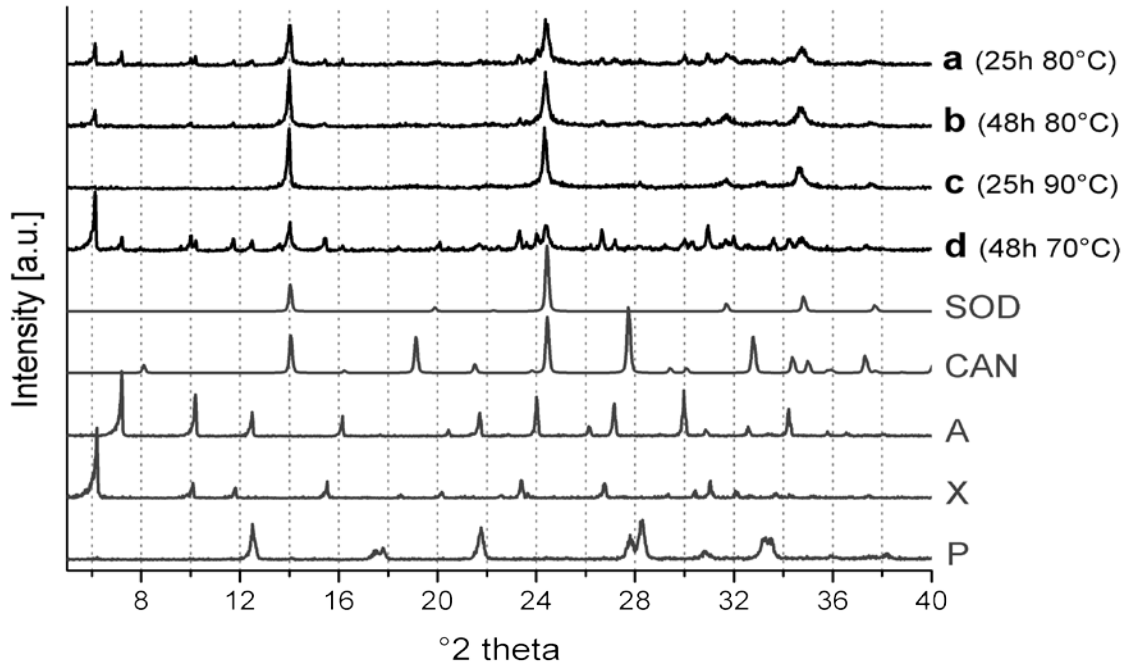

Figure 2: XRD patterns of the synthesis products from clear solution extract after crystallization at different reaction temperature and reaction time: at 80°C after 25 (sample a) and 48 hours (sample b); at 90°C after 25 hours (sample c), at 70°C after 48 hours (sample d) including the references for zeolites A, X, P, CAN, and SOD.

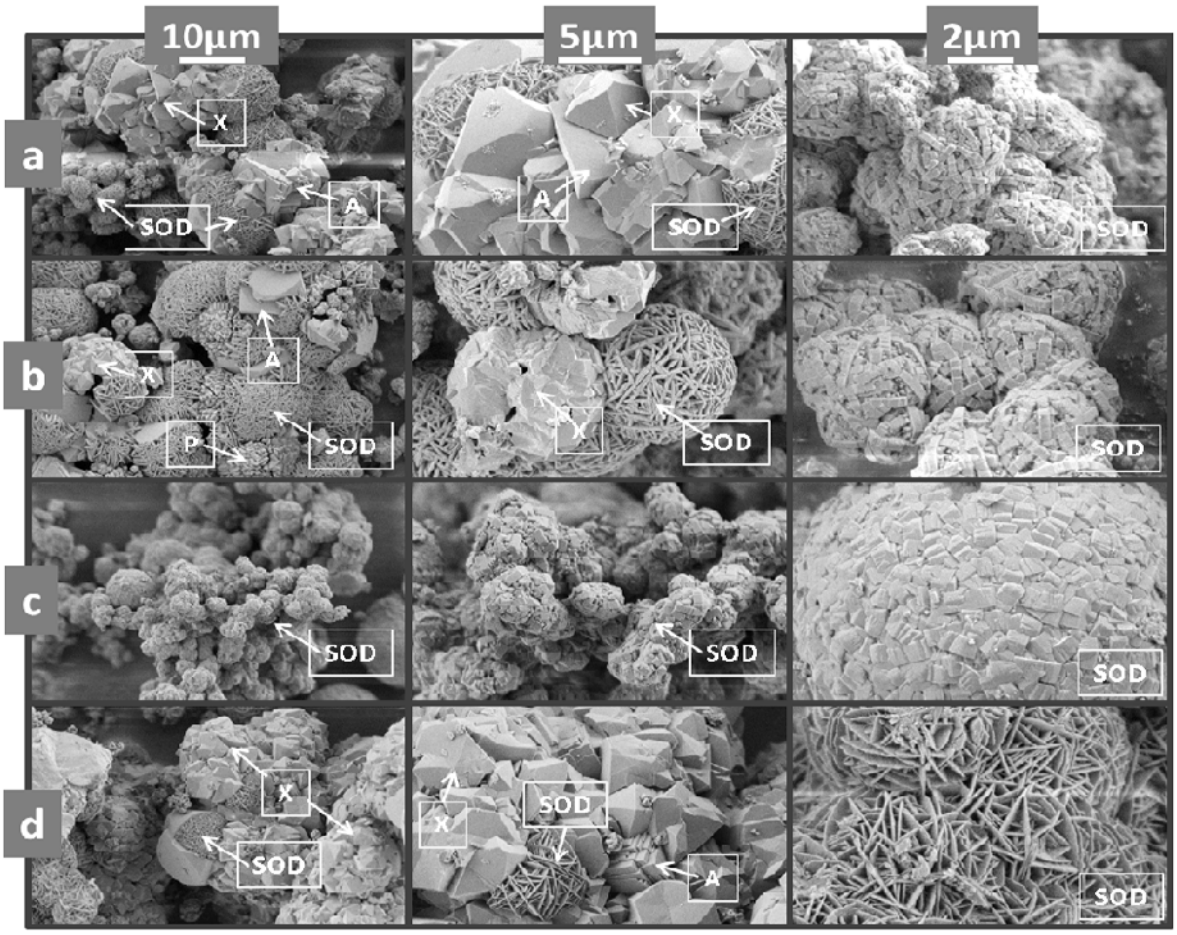

Figure 3: Selected SEM images corresponding to XRD patterns of the products synthesized at 80°C after 25 (sample a) and 48 hours (sample b), at 90°C after 25 hours (sample c) at 70°C after 48 hours (sample d).

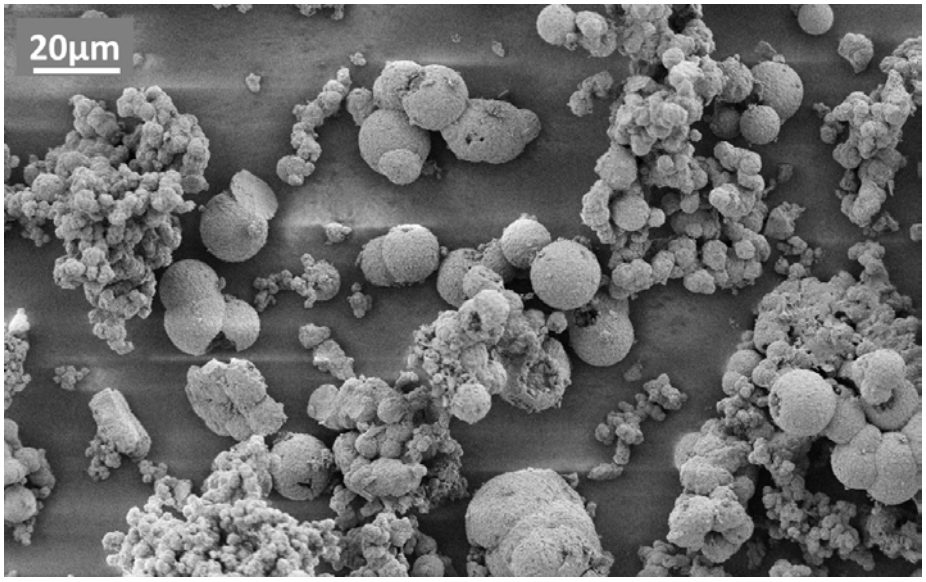

Figure 4: Overview: SEM image of different sizes of SOD.

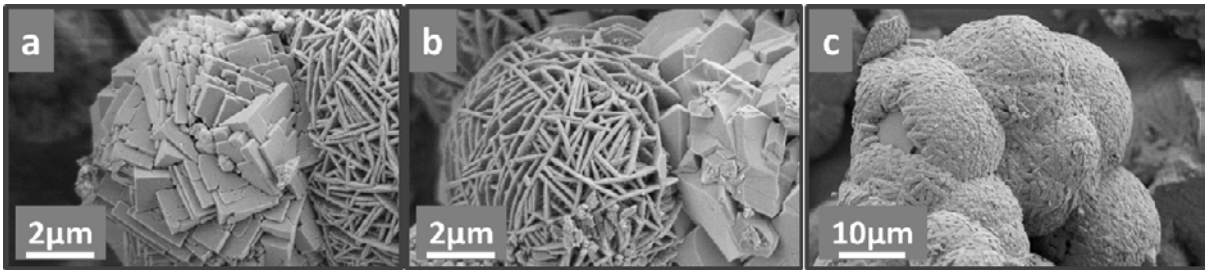

Figure 5: SEM images of armadillo-like phase overgrowing remaining particles of zeolite A and X showed by SEM images.

Element	Fly ash [wt-%] ICP	After crystallization [wt-%] ICP
Si	26.52	16.20
Al	14.53	11.00
Fe	3.46	0.38
Mn	0.01	0.01
Mg	0.62	0.01
Ca	1.47	0.04
Na	0.03	10.15
K	0.37	<0.22
Ti	0.93	<0.08
P	n.a.	0.09
S	n.a.	n.a.
Ba	0.00	0.00
Ce	n.a.	n.a.
Co	0.01	0.00
Cr	0.02	0.01
Cu	0.00	0.01
Li	0.01	n.a.
Mo	n.a.	<0.14
Nb	n.a.	n.a.
Ni	n.a.	0.01
Pb	n.a.	n.a.
Rb	n.a.	n.a.
Sr	n.a.	n.a.
Th	n.a.	n.a.
U	n.a.	n.a.
V	n.a.	0.00
Y	n.a.	n.a.
Zn	0.01	0.01
Zr	n.a.	n.a.

n.a.=not assigned

Table 1: ICP-OES results of elements of fly ash and synthesized sodalite from clear solution extracted from fused coal fly ash.