



## Model in Chemistry Education and Theoretical Foundations for the Presentation of Information Models in Chemistry

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ABSTRACT

The article presents the following in models of symbolic chemical training: demonstration; structure and consistency; durability; scientific; the importance of the principles of connection between theory and practice has been analyzed.

**Keywords:**

Educational, symbol, model, didactic, function, general methodological, principles

In order to clarify the role and importance of models in the educational and educational process, it will be necessary to cite their full classification, gnoseological function and classification.

The term "Model" is derived from the Latin words *modus*, *modulus*-which means its initial meaning - an image of a sample, layout, an object or a system of objects. For example, the atomic model, the Solar System model and the structure of nucleic acids, etc. The concept of the Model was first used in construction work, and later in the Fine Arts. The 1739 Dictionary of the German language says that the concept of a model can be made from a different material than the original, explaining that any material image of a thing is expressed in something else that is smaller in size than its own [1].

An analysis of the literature on philosophy shows that the term "model" is used primarily in two different contradictory scientific meanings-in theory in the meaning of something, that is, about what it describes or reflects (natural sciences: astronomy, mechanics, chemistry, biology, physics).

Despite the fact that the application of the term "model" in its theoretical meaning embodied similar aspects in itself, it cannot reveal the full content. Hence the application of the term model in this form indicates that there are deviations in it that are characteristic of such a theory as simplification, abstraction. However, the application in this way will not be able to reveal the specific nature of the modeling method in solving logical-gnoseological problems that are not at the level of simplification, at the stage of abstraction, do not depend on the number of abstractions obtained, but will show the style of expression inherent in the model. Such understanding of the term Model does not take into account the possibility of studying theory, hypothesis, reasoning and even perception as an object of holistic modeling.

In our dissertation research work, the concept of "model" corresponds to the second meaning. In this case, the concept of a model is understood in a broad sense as "a mentally or practically created structure that repeats one or another part of reality in a simplified (schematic or idealized) and visual form." The

Model in this case performs the task of simplifying a certain idealized reality.

In a narrow sense, the term "model" is used when describing a certain field of phenomena using another field, that is, with the help of a more deeply studied field, in other words, replacing incomprehensible ones with understandable ones. This basic essence of the model combines the concept of physical analogy with that of "the relationship of similarity of systems made up of different physical elements but of the same nature" [2.].

An integral feature of the models comes from the following definitions: all models are similar in a certain sense to their original. This relationship, as stated in the above definition, is not considered to have a natural basis, but to have an objective basis on which the material unity of the universe and its laws are implied. It is this condition that provides models withgnoseological functions.

In the relationship "Model - original", the subject of cognition occupies a certain place. In the process of creating a Model, according to the purpose of using the model, the subject, establishing a relationship between them, transmits to him the information known about the object of knowledge. It also accurately records the level and shape of the model, determining its similarity to the original. At the same time, the model can be defined only in relation to a specific original and a specific subject, which reflects the triple nature of the model relationship [3].

When describing the concept of "Model", it is necessary to take into account the fact that it is very important to reflect the relationship of the similarity between the original and the model, as well as to consider the evidence of its designation by the subject of cognition" regardless of the results of the previous and last use of the Model" [4]. This is exactly the feature of the dynamics of the relationship "model - original", which makes it possible to distinguish it from the above structural and functionally similar forms and means of cognition. So, the model:

- a unique, qualitatively unique form and at the same time a means of scientific knowledge;

- has a certain relationship with another system (original, object) ;

- the degree and depth of this relationship are determined by the goals of cognition.

When studying a model by an imaginary or real experiment-test method, the subject receives new information that depends on transferring it to the original, which is fixed in the initial situation. In this, the subject works with new information obtained in the process of studying a model that was not previously known to him.

The specified characteristics of the models are given in the following model definitions. Model:

- system, a study that serves to obtain information about another system-any object of nature that allows you to replace the object under study, provides new information about the object of study;

- an imaginary imagined or materialized system that reflects or describes a research object, allowing its study to replace it in such a way that it gives us new information about this object [4].

There is also a definition of the model as a means of obtaining knowledge: let X be a set of many considerations that describe the proportions of the elements of some complex A and B objects. And in Y, let it be a set of many reflections obtained as a result of the study of A and different from the reasoning of X. Let it be a set of many considerations that are related to B and also differ from X. If X and Y are derived from a combination according to the rules of logic, and there is a model B in A, then in B the original version of the model will be available .

In these definitions, the most important feature of the models is noted - the model is necessary not as a means of summing up the previous experience, but as a means of making various decisions.

To some extent, the definition of the model is summarized as follows by all concepts based on the above: "a model is an image of a complex original based on the totality of its essential properties to perform a specific task, which is a system used, selected or created with the aim of facilitating the understanding of

the original or making it possible to Along with the important features inherent in many models, this definition does not reflect the creative and competency functions inherent in gnoseological models [5].

The nature of the relationship between the model and the object, which is considered one of the main distinctive differences of the models, or the method of reflecting the original, is reflected in various definitions. At the same time, models are divided into material (material, physical) and mental (imaginary, abstract, ideal) models, depending on the style of presentation.

The concept of a Model is considered as a system, and in most cases its features reflect signs of genetic activity. Through the concept of "System" [6] the concept of "model" can be defined as a set of interacting structural elements that are projected onto a single whole to achieve a (i.e. cognitive) goal related to a particular knowledge.

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