



Formation of Perceptions of “Interclass Bonding” Genetic Relationships in the School Chemistry Course

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ABSTRACT

Analysis of the psychological and pedagogical features of the processes of formation and assimilation of definitions revealed specific signs of the concept of "genetic connection" and formulated the conditions necessary for the successful mastery of it by students.

Keywords:

organic, chemical, genetic, connection, concept, compound, formation

One of the important concepts not only in organic, but also in inorganic chemistry is the concept of "genetic link". Indeed, the formation of perceptions about the genetic connections between classes and compounds that are part of the school course of chemistry is a prerequisite for students to understand this science as an integral interconnected complex, leading to a deeper consideration of structural and logical relationships.

Considering the concept as a logical category, we have shown its main characteristics, one of which is content. Since the main and important features of the composition of any definition are expressed in the definition, it is necessary, first of all, to dwell on the definition of the concept of "genetic link".

The analysis of educational, methodological, philosophical and special literature showed that, despite the importance of the concept under study, its definition is almost nowhere to be found, questions about genetic connections are considered naturally. Only two examples of its definition are presented in manuals and textbooks.

A genetic link is a link that implies successive, in most cases, mutual changes of chemical compounds and their classes [1].

Genetics is a relationship based on the relationship between substances of different classes and reflecting the unity of their origin, that is, the genesis of substances [2].

In this regard, we will try to consider the etymology of this complex concept, consisting of two words "genetic" and "link", and give our definition. The word "genetic" comes from the Latin word "Genesis". In the Soviet Philosophical Dictionary, "Genesis" is described as follows:

"Genesis (birth, origin) represents the moment of occurrence, emergence, development of each qualitative definition of an object, phenomenon. Genesis is the moment in the natural process of the development of phenomena associated with a gradual and sharp transition to a new qualitative state. As the formation of a new quality, Genesis is carried out on the basis of the initial conditions created by the previous progress and is the process of mastering the transformation of the known previous conditions into a new

Integrity, a new system of interaction." The most recent Philosophical Dictionary describes: "Genesis is its origin, formation and development as a result of a certain state of the object under study" [2]. Noho izany, ny foto-kevitra hoe "genesisy" amin'ny ankamaroan'ny toe-javatra dia manondro ny hoe mandoa vola ny eritreritr'i yanagi mifototra amin'ny shortland voalohany ary misy zavatra vaovao (na tranga) mifototra amin'ireo fiheverana ireo.

Ny atao hoe "mifandray", izay mifanandrify indrindra amin'ny "connection". Ao amin'ny Rakibolana Filozofika Sovietika, izao famaritana manaraka izao dia nomena: "toe-tsaina manokana ny fiankinan-doha izay misy (tsy fisian'ny) na ny fiovan'ny zavatra sasany dia toe-javatra ho an'ny fisiana (tsy fisian'ny) na ny fanovana ny zavatra hafa" [3]. Ilaina ihany koa ny manavaka ny foto-kevitra" fototry ny fifandraisana "sy ny" toe-piainana misy fifandraisana". "Ny fototry ny firaiketampo" dia fananana iombonana, famantarana, fifandraisana izay mamela ny firaiketampo. Ny fisian'ny rohy dia zaroor, fa tsy ampy ho an'ny rohy. Mila mamorona rohy ianao, ary hahita ny rohy misy anao. Izy ireo dia tena zava-dehibe ho an'ny mpikaroka tsirairay.

Based on such considerations, we give the following general definition: "genetic link" is an interrelated relationship between objects or phenomena in the environment based on the totality of their occurrence, which consists in the gradual transformation of objects or phenomena into a new quality.

If we dwell on the school course of Chemistry for students, we can formulate the definition as follows: "genetic link" is an interaction between classes of compounds (and individual compounds), which are based on a unit of origin and reflect the process of their development and mutual conversion. In our opinion, it more fully reflects the main, important features of the content of this concept.

Now let's dwell on the analysis of the state of the problem of studying genetic links in the modern school course of chemistry.

In students, the concept of genetic connections is formed in the process of studying chemistry on the basis of successive

theoretical blocks (classes of compounds). Students receive their initial understanding in grades 8-9 in the study of inorganic chemistry. Taking into account the extraction and properties of inorganic compounds and the classes to which they belong, it is not possible that they do not pay attention to mutually close exchanges: it is possible to obtain substances belonging to the same or another class by making successive modifications from the substance of one class. With the correct approach to the formation of this concept in the course of Inorganic Chemistry, students should master it as an interconnected complex consisting of four large blocks: oxides - bases - acids - salts. Some aspects of this question are considered on the pages of methodological Journals [4].

For the study of classes of inorganic compounds L.M. Kuznetsova [5] proposes to use the principle of the opposite of reactive substances - metals and metallmas, bases and acids, base and acidic oxides, which form salts when interacting.

The importance of studying the issue of genetic relationship between substances in the school course of the science of organic chemistry can hardly be overestimated. In many training programs, the course is based on the idea of developing substances as stages of substance organization. This idea is implemented in the course structure, where the material is arranged in order of complexity, from the simplest hydrocarbons to proteins. The transition of organic substances from one class to another is closely related to a number of fundamental concepts of Chemistry - a chemical element, a chemical reaction, homology, isomerism, a variety of substances and their classification [6].

For example, in the genetic chain of changes: methane - "acetylene" -> acetaldehyde similar (preserved in all substances of the Element Carbon) and various (forms of existence of this element) cases are observed. Chemical reactions concretize the theoretical provisions of the course, many of which are practically important. Therefore, genetic exchange between substances is manifested not only with the help of reaction equations, but also

when the connection between theory and practice is carried out. When studying the genetic link between substances, students are informed about the unity of nature, the connection of its phenomena. Thus, inorganic compounds can also be introduced in the organic matter conversion process. This example reflects the subject-to-subject communication of the chemistry course. In addition, this exchange chain represents part of a common phenomenon - the phenomenon of the cycle of substances in nature. Therefore, each reaction studied in the course serves as a separate link in the entire conversion chain. At the same time, not only the method of obtaining the product is determined, but also the conditions of the reaction (use of data from physics and mathematics), the location of raw materials and factories (connection with geography), etc.

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