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THE ROLE OF ENTITIES AND PROCESSES
IN CHEMISTRY AND PHYSICS

Abstract

The process and the entity concepts in chemistry and in physics (with a few words to the same concepts in biology) have been analysed. A first aspect underlined in this paper is the relativity of these two concepts and their relations to the time-scales and to the measurement devises. In mechanics “an object in transformation” can be studied by the help of a differentiation between the “system variables”, that they identify the system, and “configuration (or state) variables”, that they describe the dynamical state of the system. Instead, in chemistry an entity is an object with characteristic properties (static and dynamical) so particular than it has a proper name. There are entities in both the macroscopic (chemical substances) and the microscopic world (molecules and atoms). A fundamental point underlined in the paper is that in the chemistry picture they exist million of these different objects. It is this complex world the material of the chemical explication of both inanimate and animate things. Also the process concept is different in chemistry and in physics. In the paper we analyse the different interpretation of the substance transformation (reactivity) in these two disciplines: in physics this is considered a modification of the equilibrium condition of a system, due to a perturbation; in chemistry a modification of the system, due to the “death” and the “birth” of different substances. The couple transformation/transition can identify the point of view of the physics and the chemistry about the substance modification. An important point underlined in the paper is that in the conceptual movement from the physics to the chemistry (and, finally, to the biology) the importance of the entity concept increases and that of the process concept decreases. The entity and process concepts generate in physics and in chemistry two different explanations: the first based on the law and the second on the presence in the system of individual entity and on their properties. In the paper we underline that this implies two different approaches to the material world: that of the physics and that of the chemistry. Two general consequences are shown in the paper: the first about the relation between the chemistry and the physics and the second on the reductionism and about the inanimate-animate and animal-man dichotomies.