

NEW TEACHING TOOLS FOR A MODERN 3D REPRESENTATION OF WATER MOLECULE IN THE COURSE OF FOOD SCIENCE

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Abstract

In the Italian IPSSEOAs, the course of Food Science is a fundamental branch of study through which students start to see food as a mixture of substances, that all living organisms use to carry out their metabolism, characterized not only by a chemical composition but also by a specific chemical structure that make them suitable to be used as food. Despite the formulation of Schrödinger's equations, based on Bohr's Complementarity Principle and Heisenberg's Uncertainty Principle, dating back to 1927, the most widespread coursebooks used by students referred to Bohr's Atomic Model that is unsuitable to make it easily understandable by students the reasons why some nutritive principles have a specific form, a specific geometric structure. Furthermore, often these students still do not have suitable knowledge in mathematics and in analytical geometry to understand this new Orbital Atomic Model, but thanks to these new teaching tools presented in this paper this difficulty seems to be no more a problem. Geomagword S.A. is a Swiss Company producing a large number of toys for children pointed to stimulate their fantasy and their handling ability. One of these toys, GEOMAG™, is constituted by a series of steel spheres and a series of steel magnetic bars coated by coloured plastic materials, with which children, aged between 6-10 years, can build complicated buildings of fantasy, but that in this case they can use to simulate the position of p orbitals of second level of Mendeleev's table of elements such Boron, Carbonium, Nitrogen, Oxygen, Fluoride and Neon. Furthermore, by connecting these GEOMAG™ elements in an opportune way it is possible to simulate also the position of hybrid orbitals sp_3 , sp_2 and sp hollowing the building of a tridimensional model of water molecule putting in evidence the bond's angles between the orbitals and giving the opportunity to the teacher to offer his considerations to his students. It is also possible, by comparing different structure referred as Boron Hydride (BH_3), Metane (CH_4), Ammonia (NH_3), Water (H_2O) and Hydrofluoric acid (HF), putting in evidence their different chemical properties.

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