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NOVAL TRENDS IN CARBON CYCLE MODELLING

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The hallmark of the recently proposed model of the global carbon cycle is that it considers the movement of the carbon through different geospheres and the biosphere as the cyclic transition from the reduced forms of the element obtained in photosynthesis to the oxidized, presented by CO_2 , bicarbonate and carbonate ions. The source of oxidized inorganic forms of carbon in the atmosphere and hydrosphere, used in photosynthetic assimilation, is the CO_2 . It is produced in oxidation of sedimentary organic matter by means of thermochemical sulfate reduction at the expense of energy evolved in lithospheric plates' collisions with participation of continental plates. Due to irregularity of plates' motion, CO_2 enter the "atmosphere – hydrosphere" system in the short-term orogenic period. In the following long-term geosynclinal period photosynthesis and weathering become the main processes on the Earth. It results in depletion in inorganic carbon pool in the system. Both periods make orogenic cycles. This model of carbon cycle is followed by the experimentally observed chemical and isotopic variations in carbon, sulfur, oxygen and other elements in rocks. The experimental data proves the validity of the model and may be used for chemical and biological evolution. The analyses of these variations in the course of geological time allows studying long-term climate changes, periodic biosphere events, photosynthesis evolution and stratigraphic distribution of formation of the rocks, rich in organic matter (source rocks) and oils. The suggested model establishes links between geological processes and biosphere events, their interconditionality and interference, predicted by the outstanding Russian geochemist V. I Vernadsky in 1926.



Biography

A A Ivlev has completed his PhD (1968) from Chemical Technology Institute of Mendeleev (Moscow) and completed his Postdoctoral studies from Institute of Chemical Physics of Russian Academy of Sciences and got his 2nd PhD (1986). In 1995, he became a Full Professor of Russian State Agrarian University. He has published more than 100 papers in the reputed journals and has been serving as an Editorial Board Member of 4 of them. He is an author of 4 scientific monographs and of 2 discoveries. He was awarded by the medal of the Russian Academy of Natural Sciences To Author of Scientific Discovery. The area of his interests include: isotope fractionation, cell metabolism, plant physiology, evolution, organic geochemistry, biogenesis, carbon cycle.

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