Research and Development of Geochemical Model from the Perspective of Big Data

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Geochemical model is a research method conducting a quantitative study on the interaction among water, rock and atmosphere in the geochemical system. According to research contents, theoretical basis and structural approaches, it can be divided into 3 categories. Component distribution model focuses on the study of material components, material balance model pays close attention to capturing the change rules of material reaction, and material migration or reaction path model emphasizes the control of reaction process and the direction prediction of chemical action. These three kinds of effect run through the cyclic process from material decomposition to chemical combination to decomposition, constituting the whole process of geochemical action. However, the traditional geochemical model has defects in two aspects. First, there is no sufficient longitudinal model research, and coupling errors exist between geochemical model and the actual chemical action, which is closely related with the sample extraction and data analysis capability. The scientificalness of sample extraction and the data analysis capability in traditional geochemical model are shackled by the development of science and technology at that time. Therefore, certain errors can be found in the model data extraction and scientific data analysis etc., or even larger errors exist, which affects the scientificalness and accuracy of the model. Second, limited cross-sectional study is conducted on the model. Due to restricted data processing capability, undeveloped interconnected system and IOT system, and limited data sharing and physical shared connection of resources, research fields of geochemical model are confined to several main directions and it fails to be involved in a broader field.

The arrival of the era of big data provides powerful data processing capabilities and dynamic maintenance capabilities for geochemical model research. The research and application of geochemical model will continue to expand horizontally and extend vertically in the future, forming a geochemical model system with the combination of characteristics, including covering all fields, multi-angle of view, high accuracy, scientificalness and dynamic property. Thereby, it can serve the whole field of Earth Science Research more scientifically and reasonably.