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EDITORIAL
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Editorial: Tectonic and Environmental Reconstructions: Perspectives From Geochemistry and Isotopes of Sedimentary Rocks

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Editorial on the Research Topic

Tectonic and Environmental Reconstructions: Perspectives From Geochemistry and Isotopes of Sedimentary Rocks

Sedimentary sequences hold the remarkable advantage that they comprise a vertically accumulated and relatively undistorted record of erosion, sedimentation, and climatic-tectonic environments and, therefore, obviate many of the difficulties intrinsic in disentangling complex structural overprints (McLennan et al., 2001; Zhang, 2004; Pietranik et al., 2008; Zhang et al., 2007; 2012, 2017). The geochemical and isotopic studies of sedimentary rocks and minerals therein form a vital approach to tectonic and environmental reconstructions. Latest decades have witnessed significant progress in geochemistry and isotopes of sedimentary rocks and minerals and their applications to fundamental geological issues. For example, advances in dating on calcite using U–Pb isotopic system (e.g., Roberts et al., 2017; Godeau et al., 2018) and dating on illite using K–Ar isotopic system (e.g., Hamilton et al., 1989; Pevear, 1999) provide additional methods to define the ages of sedimentation/strata besides the conventional paleontological method; documentation of U–Pb–Lu–Hf isotope systematics of detrital zircons from siliciclastic rocks makes it possible to examine the nature of major crustal growth events (e.g., McLennan et al., 2001; Pietranik et al., 2008), both regional and global; work on the geochemistry of limestones deposited in various plate tectonic settings permits the development of proxies for the discrimination of depositional regimes (Zhang et al., 2017). Therefore, the collection of works regarding this topic is timely and essential to exchange new ideas in the international community and provoke and promote studies in this field.

In the collection of this Research Topic, 11 contributions were published, with a focus on the recent advances in sedimentary geochemistry and isotopes at whole-rock and/or single mineral scale and their applications to tectonic and environmental reconstructions. Besides, this topic collected provocative ideas regarding the methodology and give summaries of its recent development. Importantly, this Research Topic presented new datasets or summaries on the geochemistry and isotopes of specific sedimentary rock or mineral on key regimes. Moreover, this Research Topic published practice examples on a regional scale that can be tracked and referred to by researchers in the same field.

The collection covers the following several major themes.

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1) Sedimentary geochemistry and isotopes and their applications to unraveling the paleogeographic, paleoclimatic, and sedimentary evolution of the maritime space in the western Pacific.

For example, Li et al. and Liu et al. explored the sources of organic carbon in the Mariana Trench, the deepest part of the earth, and the paleoclimate of the middle Okinawa Trough Since the Middle Holocene, respectively, both based on analysis of glycerol dialkyl glycerol tetraether (GDGT). Wang et al. documented the hydrocarbon geochemistry of core sediments from the SW Basin of the South China Sea and probe the implications for sedimentary environment. Xu et al. envisaged topographic and climatic control on chemical weathering of mountainous riverine sediments of Hainan Island, South China Sea, based on investigation of sedimentary geochemistry.

2) New ideas on the methodology regarding sedimentary geochemistry and isotopes as well as their applications to geological issues.

Liu et al. analyzed Mesozoic tectono-thermal events of the Qinshui Basin in central North China Craton, based on measurements on illite crystallinity and vitrinite reflectance. Li et al. reconstructed the maximum burial temperature of the Sichuan Basin, southern China in use of clumped isotopes. Shaogong et al. dated the paragneiss in the Dabie–Sulu UHP orogen of eastern China by means of zircon U-Pb isotope systematics.

3) Geochemistry and isotopes of specific sedimentary rock or mineral on important regimes.

Yang et al. investigated the whole-rock and *in situ* geochemistry of siderites in the Lopingian coal-bearing series, western Guizhou of southern China to reveal their genetic mechanism and environment implications. Chenrai et al. reported the occurrence and genesis of bedding-parallel fibrous calcite veins in Permian siliciclastic and carbonate rocks in central Thailand.

4) Applications of sedimentary geochemistry to petroleum industry

This is the most characteristic brightness of this collection. For example, Yingjie et al. reported the variation of clay minerals during alkaline surfactant polymer flooding in the oilfields in the Songliao Basin of eastern China. Fan et al. carried out pyrolysis experiment on water-saturated shale plunger samples to shed insight to oil generation and expulsion of shales.

AUTHOR CONTRIBUTIONS

K-JZ contributed to conception and wrote and reviewed the manuscript. K-JZ, Q-TH, JW, TU, and LL contributed to manuscript revision, read, and approved the submitted version.

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