XU Deru, HU Guocheng, LIN Ge, QIU Liangbin, CHEN Guoneng, ZHOU Yueqiang and HOU Maozhou, 2014. Re-Understanding on the Mechanism of Tectonic-Magmatic Activity (the Diwa Theory) and Associated Ore-Forming Processes of Polygenetic Compound Deposits. *Acta Geologica Sinica* (English Edition), 88(supp. 2): 1699.

Re-Understanding on the Mechanism of Tectonic-Magmatic Activity (the Diwa Theory) and Associated Ore-Forming Processes of Polygenetic Compound Deposits

XU Deru[1], HU Guocheng[1,2], LIN Ge[1], QIU Liangbin[1], CHEN Guoneng[3], ZHOU Yueqiang[1,2] and HOU Maozhou[1,2]

1 Key Laboratory of Mineralogy and Metallogeny, Guangzhou Institute of Geochemistry, Chinese Academy of Sciences, Guangzhou 510640, China
2 University of Chinese Academy of Sciences, Beijing 100049, China
3 School of Earth Science and Geological Engineering, Sun Yat-sen University, Guangzhou 510275, China

In combination with the latest research progresses on modern continental dynamics and geodynamics, and their applications to geoscientic system, this paper has re-scanned and re-analyzed the mechanism of tectonic-magmatic activity (i.e. the Diwa Theory) and associated ore-forming process of polygenetic compound deposits (Chen, 1956, 1996). We suggest that the dynamic mechanism for the tectonic-magmatic activity coincides with that for plate tectonics, with both of them driven by mantle (plume) convection and upwelling, or by interaction between mantle plume and lithosphere. Given that both plate movement and mantle plume activity were of Wilson-type cycle or multistage nature, the conception of *Polycyclic Tectonic-Magmatic Activity* also should be designated to the Diwa Theory. This thus suggests that the tectonic-magmatic activated region (i.e. the Diwa Region) proposed by Prof. Chen Guoda (Chen, 1956) should refer in particular to those regions akin to the Eastern China which was characteristic of strongly crustal activities during the Mesozoic with the tectonic development of South China. Because of an intimate genetic link to geotectonic development and related geodynamic evolution, associated metallogeny also should be induced by mantle (plume) convection and upwelling, and/or by interaction between mantle plume and lithosphere, and indicates polycyclic nature, particularity and/or superimposed reworking and enrichment, corresponding to natures and differentiations of crustal evolution and multistage geotectonic development. Especially, tectonic-magmatic activated regions generally show multistage geotectonic development and have been characteristic of large-scale tectonometamorphic, tectonomagmatic and tectonothermal (fluid) events, therefore, associated metallogeny in these regions is also polygenetic and often leads to high-grade polygenetic compound ore deposits which are of economic significance. Hereby, polygenetic compound ore deposit substantially is coupling product as a result of interaction among geological processes including sedimentation, tectonic deformation, magmatism, metamorphism and large-scale concomitant fluid acitivies, which result from multistage mantle (plume) convection and upwelling, or interaction between crust and mantle, or intercoupling between mantle plume and lithosphere. Finally, we point out that the future research on polygenetic compound ore deposit should be put on the ore-forming dynamic mechanism and related physicochemical process (Xu et al., 2014).

References

Chen Guoda, 1956. An example of the tectonic-magmatic activated regions (Diwa region) from Chinese paleoplatform: a particular discussion on tectonic problem of the Cathaysian continent. Acta Geologica Sinica, 36(3): 239-272 (in Chinese with English abstract).

Chen Guoda, 1996. Diwa thesis: an introduction to the tectonic-magmatic activity and associated metallogenic system. South-Central University Press, Changsha (in Chinese with English abstract).

Xu Deru, Wu Chuanjun, Lü Guxian, Zhou Yueqiang, Yu Liangliang, Zhang Jianling, Hu Guocheng and Hou Maozhou, 2014. Application of lithospheric rheology to structural metallogenesis: taking the BIF-type iron-rich ore deposits as an example. Geotectonica et Metallogenia (in press). (in Chinese with English abstract).

* Corresponding author. E-mail: xuderu@gig.ac.cn