

Mountains (Da Xing'an Range) area; the third group (2025 ~ 1673 Ma) corresponded to the geological event of Columbia supercontinent formation; the fourth and the fifth groups of zircons (1036 ~ 673 Ma, 574 ~ 422 Ma) may originate from the Northeast China, and these two age groups corresponded to two key tectonic events of the Gondwana and Rodinia episodes, respectively; the peak value of the sixth age cluster (392 ~ 312 Ma) is 350 Ma and its weighted mean age is 350.0 ± 6.5 Ma (MSWD = 4.0, $n = 43$), which can be identified as the protolith age of the Dashizhai Formation; the fifth cluster (224 ~ 133 Ma) may be related to fluid reformation. Whole-rock major, trace and rare earth elements analyses show that most samples exhibit metaluminous ($A/CNK = 0.65 \sim 1.95$) and sub-alkaline ($\delta = 0.88 \sim 2.50$) characteristics. In the Chondrite-normalized REE patterns, the tuffs show slightly enriched in LREE, depleted in HREE, with no obvious Eu anomalies. In the spider diagram, they show enrichment in large ion lithophile elements (Ba, Rb and K), and depletion in high field-strength elements (Nb, Ta, Ti and P). As shown above, the Dashizhai Formation tuffs exhibited an affinity with Andean active continental margin volcanic rocks. Combined with previous published regional geological data, we concluded that the Dashizhai Formation andesitic debris crystal tuffs in Hexigten Banner were formed by the fluids, which derived from dehydration of oceanic crust during the subduction of the Paleo-Asian Ocean, interacting with the overlying mantle wedge. And the tectonic environment for the formation of the tuffs was active continental marginal arc, indicating that the Paleo-Asian Ocean wasn't closed in Early Carboniferous.

Keywords: Hexigten Banner (Keshiketeng county); Dashizhai Formation; geochronology; petrogeochemistry; Paleo-Asian Ocean

Acknowledgements: This study was supported by National Natural Science Foundation of China (No. 41602065) and the program of Jinda Mining Development Co., Ltd. of Hexigten Banner (No. 20150008)

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Manuscript received on: 2018-04-09; Accepted on: 2018-12-13; Edited by: ZHANG Yuxu

Doi: 10.16509/j.georeview.2019.01.009

认真谋划新时代地质科技创新工作

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新一届中国地质调查局党组高度重视科技创新工作, 形成了以科技创新为核心的建局方略, 强力推进地质调查科技创新工作, 实现了重大理论创新、关键技术突破和核心装备研发, 支撑解决资源环境重大问题取得突破性成果, 在国内外产生了重大影响。

党的十九大描绘了新时代的宏伟蓝图。实现两个一百年目标和科技强国是新时代的新要求。在地质工作转型发展的重要关键节点, 我们需要认真谋划新时代地质科技创新工作, 加快创新, 全面提升依靠科技创新解决资源环境重大问题的能力。要实现中国地质调查局局长钟自然在培训班讲话中提出的地质调查事业发展的战略目标, 必须以习近平新时代中国特色社会主义思想为指导, 认真贯彻习近平总书记两院院士大会上的重要讲话精神和党的十九大精神, 落实党中央国务院关于科技创新的决策部署, 按照局党组提出

的“将科技创新和信息化建设作为新时代地质工作转型升级的两大引擎”的重大要求, 进一步转变观念, 适应自然资源综合管理新要求, 坚持“双轮驱动”, 深化体制机制改革, 推进地质科技创新, 全面提升创新能力, 加快建设世界一流的新型中国地质调查局。

1 要进一步夯实科技创新基石

全面贯彻“科技创新和信息化建设是新时代地质工作转型升级两大引擎”的重大部署, 进一步夯实科技创新这个基石, 把局党组对科技创新的各项决策落实到科技外事部方方面面的工作, 在科研项目、人才培养、平台建设、成果转化、国际合作、境外地质调查等工作中, 进一步强化科技创新, 落实科技创新的目标责任, 将科技创新贯穿于地质调查的全流程管理, 真正实现用科技创新改造、支撑和引领地质调查的目的, 为建设世界一流新型地调局做出更大贡献。

