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Deru Xu, Monika A. Kusiak, Zhilin Wang, Huayong Chen, Nonna Bakun-Czubarow, Chuanjun Wu, Patrik Konečný, Peter Hollings

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**Microstructural observation and chemical dating on monazite from the Shilu Group,
Hainan Province of South China: implications for origin and evolution of the Shilu
Fe-Co-Cu ore district**

Deru XU^{a,b,*}, Monika A. KUSIAK^{b,c,*}, Zhilin WANG^{d*}, Huayong CHEN^a, Nonna

BAKUN-CZUBAROW^b, Chuanjun WU^a, Patrik KONEČNÝ^e, Peter HOLLINGS^f

^a CAS Key Laboratory of mineralogy and metallogeny, Guangzhou Institute of Geochemistry, Chinese Academy of Sciences, Guangzhou 510640, China

^b Institute of Geological Sciences, Polish Academy of Sciences, 00-818 Warszawa, Poland

^c Swedish Museum of Natural History, Box 50007, SE 104 05 Stockholm, Sweden

^d School of Geosciences and Info-Physics, Central South University, Changsha 410083, China

^e Štátny geologický ústav Dionýza Štúra, Bratislava, Slovakia

^f Department of Geology, Lakehead University, 955 Oliver Road, Thunder Bay, Ontario, Canada P7B 5E1

*Corresponding authors with the equal contribution. Tel.: +48-22-6978741, E-mail: mkusiak@twarda.pan.pl

(M. A. Kusiak) ; +86-020-85292713, E-mail: xuderu@gig.ac.cn (D. R. Xu)

Abstract

New monazite chemical U-Th-total-Pb (CHIME) ages, combined with microstructural observations, mineral compositions, and whole-rock geochemistry, indicate that the large-scale, banded iron formation (BIF)-type Shilu Fe-Co-Cu ore district in Hainan Province, South China is a multistage product of sedimentation, metamorphism, and hydrothermal-metasomatic alteration associated with multiple orogenies. Two types of monazite, i.e. “polygenetic” and “metamorphic”, were identified. The “polygenetic monazite” comprises a magmatic and/or metamorphic core surrounded by a metamorphic rim, and shows complex zoning. Breakdown corona structure, with a core of monazite surrounded by a

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