

Accepted Manuscript

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PII: S0169-1368(17)30947-2

DOI: <https://doi.org/10.1016/j.oregeorev.2018.04.006>

Reference: OREGEO 2550

To appear in: *Ore Geology Reviews*

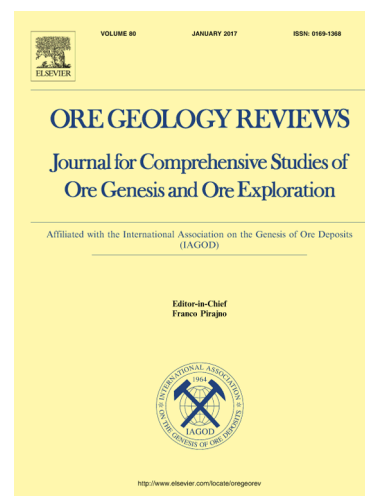
Received Date: 6 December 2017

Revised Date: 2 April 2018

Accepted Date: 4 April 2018

Please cite this article as: Y. Zhang, J-F. Gao, D. Ma, J. Pan, The role of hydrothermal alteration in Tungsten mineralization at the Dahutang tungsten deposit, South China, *Ore Geology Reviews* (2018), doi: <https://doi.org/10.1016/j.oregeorev.2018.04.006>

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The role of hydrothermal alteration in Tungsten mineralization at the Dahutang tungsten deposit, South China

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Abstract:

The giant Dahutang tungsten deposit has total reserves of more than 1.31 Mt of WO_3 with a scheelite/wolframite ratio of ~ 1 and is mainly hosted by the Neoproterozoic Jiuling granodiorite batholith (~ 820 Ma). The deposit is characterized by four types of alteration, including biotite alteration, phyllic alteration, greisenization and silicification. Whole-rock geochemical analyses showed that the elements Ti, Ni, V, Sc, and Lu exhibited immobility during the four alteration processes. The mobile element geochemistry effectively differentiated among four distinct hydrothermal alteration styles. During the biotite mineralization, there were mass gains in Al_2O_3 , Fe_2O_3 , MnO, MgO, K_2O , P_2O_5 , and W and depletions in SiO_2 , CaO, and Na_2O . The phyllic alteration exhibited mass gains in SiO_2 , Fe_2O_3 , MgO, and W and depletions in CaO, Na_2O , and K_2O , but Al_2O_3 , MnO, and P_2O_5 were immobile. The weak greisenization exhibited mass gains in SiO_2 , Fe_2O_3 , K_2O , P_2O_5 and W and depletions in Na_2O , MgO, and CaO, whereas Al_2O_3 and MnO remained immobile. The silicification exhibited mass gains in SiO_2 and W and depletions in Al_2O_3 , Fe_2O_3 , MgO, CaO, Na_2O , and K_2O , but MnO exhibited immobility. These alterations were

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