Free Public Zoom Lecture

Lakehead UNIVERSITY | Department of Geology

SEMINAR SERIES 2021

Research Seminar Presented By:

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"A fundamental role of carbonate–sulfate melts in the formation of iron oxide–apatite (IOA) deposits"

Kiruna-type iron oxide-apatite (IOA) deposits are an enigmatic class of magnetite-rich systems with a wide range of proposed genetic models. Here I present the results of three studies which examine inclusions in ore-stage apatite, diopside, and magnetite from characteristic IOA systems. These studies show that IOA mineralization in all three systems is associated with unusual Fe-rich, carbonate-sulfate melts which show remarkable consistency in terms of their compositions and micro-thermometric behavior. Moreover, carbon (δ13C) and oxygen (δ18O) isotope data indicates that these melts were formed via the anatexis and/or assimilation of local evaporite-bearing sedimentary rock by mafic-intermediate magmas in these systems. This interpretation is supported by the common occurrence of mafic-intermediate intrusive rocks crosscutting and assimilating evaporite-bearing carbonate strata in many notable IOA localities. These results indicate that a previously unrecognized genetic process involving crustal anataxis is involved in the formation of IOA mineralization and perhaps also promotes the formation of other Fe-, Ti-, and REE-rich systems.

Thursday, April 15th, 2021

10:00 AM Zoom Event

(To participate email pnhollin@lakeheadu.ca or kcarey@lakeheadu.ca for the Zoom Link & Password)