

Mineral paragenesis and alteration of the Mt. Carbine tungsten deposit far north Queensland.

The late stage evolution of an S-type granite

S. Krneta, Honours thesis, 2011.

Department of Earth & Environmental Sciences, University of Adelaide

Supervisor: I. R. Plimer

Abstract

The Mt. Carbine tungsten deposit represents a good example of granite related sheeted vein mineralization recording the late stages of granite cooling volatile differentiation and subsequent expulsion. The presence of 3 distinct mineralizing stages has been recognized through the study of the alteration and mineral paragenesis. These observations coupled with geochemical analysis have culminated in unraveling some of the physiochemical conditions under which the deposit formed and their dynamic evolution through time. Along with gaining important insights into the formation of the deposit analysis were conducted on individual minerals from different parts of the deposit as an investigation into their possible use as geochemical vectors to mineralization through trends in trace and REE chemistry. The findings of the study indicate that the deposit formed as a result of fluid expulsions from a single magmatic event forming a distinctive high to low temperature and reduced to oxidized fluid evolution. The study also found the presence of 2 distinct alteration assemblages which although containing some lithologically induced heterogeneities appear as a alkaline distal and potassic proximal alteration. The use of mineral geochemistry as an exploration tool in many of the tested cases have proven to either be of little potential use whereas others have not been tested adequately. Wolframite Fe/Mn ratios have proven as being potentially useful as a means of delineating vertical displacement from the source of the mineralizing fluids due to the telescoped nature of the vein fill minerals.

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