

Alteration Characteristics of the Newly Discovered AG Zone Deposit Volcanogenic Massive Sulfide Prospect, Palmer Property, Southeast Alaska

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The Palmer property located in southeast Alaska, ~60 km northwest of Haines, hosts the Palmer and AG Zone VMS deposits. This research focuses on white mica physico-chemical variations within the AG Zone deposit.

Alteration within the AG Zone deposit consists of five distinct color variations of white mica: brown, green, grey, white, and pink. This study evaluates these physico-chemical variations using short wave infrared (SWIR), petrography, and electron microprobe analysis (EPMA). SWIR data indicate the wavelength of the Al-OH absorption feature of white mica in mineralization proximal samples (within 100 m) tends to be shorter (paragonite-muscovite). The Al-OH absorption feature of white mica in distal samples tend to be longer (muscovite-phengite), providing a vector towards mineralization. EPMA results show white mica color variation is related to its chemical composition. Of all the samples analyzed, the pink color variant contains the highest weight percentage of SiO₂, Al₂O₃, and NaO. The pink variant also has the relatively least weight percentages of K₂O, MgO, and TiO₂.

Al-OH wavelength absorption increases as the FeO and MgO oxide weight percentages increase, providing another vectoring tool. A relationship exists between FeO, MgO weight percent and the K₂O/Na₂O ratio, both increase distal from the upwell center. Crystallinity in samples varies from microcrystalline elongate crystals to platy intergrown microcrystalline crystals and a third type of crystallinity which consists of cryptocrystalline and amorphous white mica. The results of this study shed new light onto white mica physico-chemical variations within the AG Zone deposit, vectoring future research and exploration.