

Metamorphic Alteration of the Jurassic Metavolcanic Member, Winterhaven Formation, SE California;
Implications for Classification and Interpreting Tectonic Setting

Erik Gordon

The metavolcanic member of the Winterhaven Formation was erupted in an arc graben depression associated with extension during Jurassic subduction of the ancestral Pacific Plate beneath the California coastline. Analysis of 19 thin sections collected from the metavolcanic member indicate varying degrees of hydrothermal alteration. Alteration minerals include quartz, calcite, white mica, and chlorite. Point counting established ratios of altered to unaltered minerals, and the recognition of three ranks of alteration designated from least to most altered, ranks I, II, and III. These ranks are heterogeneously distributed on a geologic map, and as a result, the metamorphic alteration is interpreted to be the result of one or more regional events. Textural data indicate that the TAS classification diagram should not be used to classify rocks studied during this investigation. As a result immobile trace element plots using Zr/TiO_2 and Nb/Y ratios were used. These plots indicate an overall basaltic composition, and tholeiitic calc-alkaline plate margin basalt origin.