

MAGMA MINGING IN THE ANOROGENIC PROTEROZOIC WEST CREEK PLUTON, PIKES PEAK BATHOLITH, COLORADO.

CHASTAIN, Lynne M. and NOBLETT, Jeffrey B., Geology Dept., Colorado College, Colorado Springs, CO 80903

The West Creek quartz syenite pluton is one of seven small plutons which comprise an alkalic trend within the 1080 Ma Pikes Peak batholith. A unique occurrence of mingling of quartz syenite and diabase crops out near the southern margin of the pluton. Field relationships show apparent pillowing of diabase in the quartz syenite though the reverse relation was not observed. The quartz syenite contains K-spar (65%), quartz and plagioclase (labradorite) with hornblende (4%) and traces of biotite, opaques and zircon. It contains 65.7% SiO₂, 5.55% Na₂O, 5.33% K₂O and has an FeO/MgO ratio of 51.6. Trace elements include 490 ppm Zr, 412 ppm Ba, 210 ppm Rb with Sr below detection limits. It is LREE enriched with a negative Eu anomaly. It plots as an A-type granitoid. The diabase contains plagioclase (An₆₉, 52%), secondary biotite (39%), clinopyroxene (7%) and traces of opaques, apatite and quartz. Large sodic labradorite crystals occur in disequilibrium with the groundmass. The diabase had 53.9% SiO₂, 5 ppm Cr, 130 ppm Ni and an Mg-number of 22. Normalized to MORB, it is enriched in LREE with no Eu-anomaly. It is tholeiitic and plots near within-plate basalt fields.

Studies of compositions near the contacts of the two rocks indicate only minor physical mixing has occurred, but chemical exchange has been variable. Hornblende occurs near the contact in the diabase, while the quartz syenite side of the contact has higher contents of quartz, biotite and hornblende, but less K-spar and a more-calcic plag. Si, Al, Mn, Zr, Tm, Yb and Nb showed little or no variation in either quartz syenite or diabase as they approach the contact. Mg and Sc increased in both rocks near the contact. K, Eu, Ba, Th, U, and Ru show linear trends across the contact. Rb, Zn, Cs, Ti, La and Fe increased on one side of the contact while decreasing on the other.

The observed concentrations do not allow the diabase to be a mantle melt generating and mixing with syenite to form the West Creek pluton. The diabase is an evolved liquid of within-plate, mantle descent commingling with quartz syenite in this portion of the batholith.