

256-7 - MAGMA EMPLACEMENT AND DIFFERENTIATION IN THE OLIGOCENE IXL PLUTON, NEVADA



Wednesday, 12 October 2022



3:05 PM - 3:20 PM



502 (Colorado Convention Center)

Abstract

The Oligocene IXL pluton and associated volcanic rocks represent a continuous, 10 km-thick cross-section of a magmatic system in the Stillwater Range, NV. This location is ideal for the study of upper-crustal magmatic processes since the original geometry of the system can be restored. A total of 57 whole rock measurements from the IXL pluton (including 33 new measurements produced as part of this study) indicate that the pluton is vertically stratified with a general change from ~57-60 wt. % SiO₂ near the bottom to ~65-68 wt. % SiO₂ near the top. The systematic variation suggests that the pluton may have been geochemically stratified due to gravitationally-driven processes such as compaction or crystal settling. To test this possibility, we produced CA-ID-TIMS U-Pb zircon dates from nine samples within the pluton. They suggest a minimum of 500 kyr of zircon crystallization in the pluton. Zircon crystallized continuously during this period, however, individual hand samples only contain 100-200 kyr of zircon age dispersion. These age differences may represent emplacement of multiple magma increments or differential cooling within a crystal-rich magma reservoir. Interpretations for the source(s) of geochemical variation within the pluton are dependent on distinguishing between these two possibilities. Field observations, geologic mapping, and textural studies of the pluton will be used to further investigate the processes at play as the magma cooled and crystallized. The overlying volcanic units will also be dated using CA-ID-TIMS U-Pb zircon to explore the link between the pluton and potentially synchronous extrusive units.

Geological Society of America Abstracts with Programs. Vol 54, No. 5, 2022
doi: 10.1130/abs/2022AM-378854

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