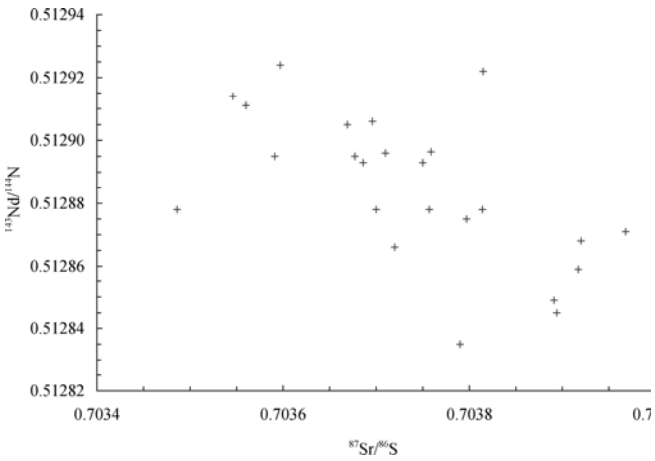
ASSESSING THE CRUSTAL AND MANTLE SOURCES FOR MT. RAINIER VOLCANICS

V.J.M. Salters, A. Sachi-Kocher (FSU, Geological Sciences and NHMFL), Sisson, T. (USGS)

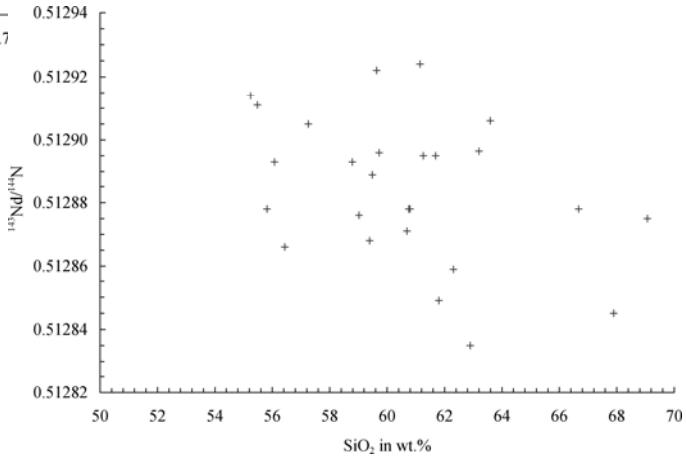
Introduction

Along the western US calc alkaline volcanism is abundant and active as is witnessed by the recent eruptions of Mt. St. Helens. Mt. Rainier, another calc-alkaline volcano in the western US, is also active and is the closest to population centers and has 15 populations centers that are built on volcanic material less than 5,600 years in age. Understanding the sources of the volcanism and determining where the volcanic products obtain their silicic (and most explosive) character will help in predicting the volcanoes future.



Experimental

Samples, previously analyzed for major and trace elements were dissolved and Nd and Sr pure separates were produced using standard ion exchange techniques. The Nd and Sr fractions were analyzed using thermal ionization mass spectrometry.



Results and Discussion

Top figure is an isotope correlation diagram for Nd and Sr isotopes showing these two systems are well correlated. Two sigma error on the isotope ratios is smaller than the symbol plotted. Additionally the range in Sr and Nd-isotopic composition is limited and show a limited range in isotopic composition. The bottom figure shows that the Nd-isotopic composition the silica content are not well correlated. Silica content increases with increasing degree of fractionation. This lack of correlation indicates that the crustal contamination does not play an important role in creating the differentiated rhyolites and argues for a shallow level magma chamber. The surrounding crust in this shallow magma chamber is too cold to cause any major contamination of the magma.