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## Isolating U and Pb from the Dissolved Zircon

For high-precision analysis of zircons by Isotope Dilution Thermal Ionization Mass Spectrometry (ID-TIMS), U and Pb from each dissolved grain are separated and collected in a chemical process called “ion chromatography”



## Preparing Ion Exchange Columns

Tiny columns filled with resin are used to separate the U and Pb in each zircon. When a dissolved zircon solution is washed through the column, the resin holds on to the U and Pb until different quantities and strengths of acid are added.



## Cleaning Beakers

Teflon beakers will be used to collect the separated Pb and U from the zircon solutions. Before they are used these beakers are cleaned with strong acids like hydrofluoric and hydrochloric acid.



## Preparing Samples

While the columns are being set up and cleaned, the dissolution vessel containing the zircon samples is removed from the oven, cooled, cleaned and brought into the clean lab. The capsules are removed from the vessel.



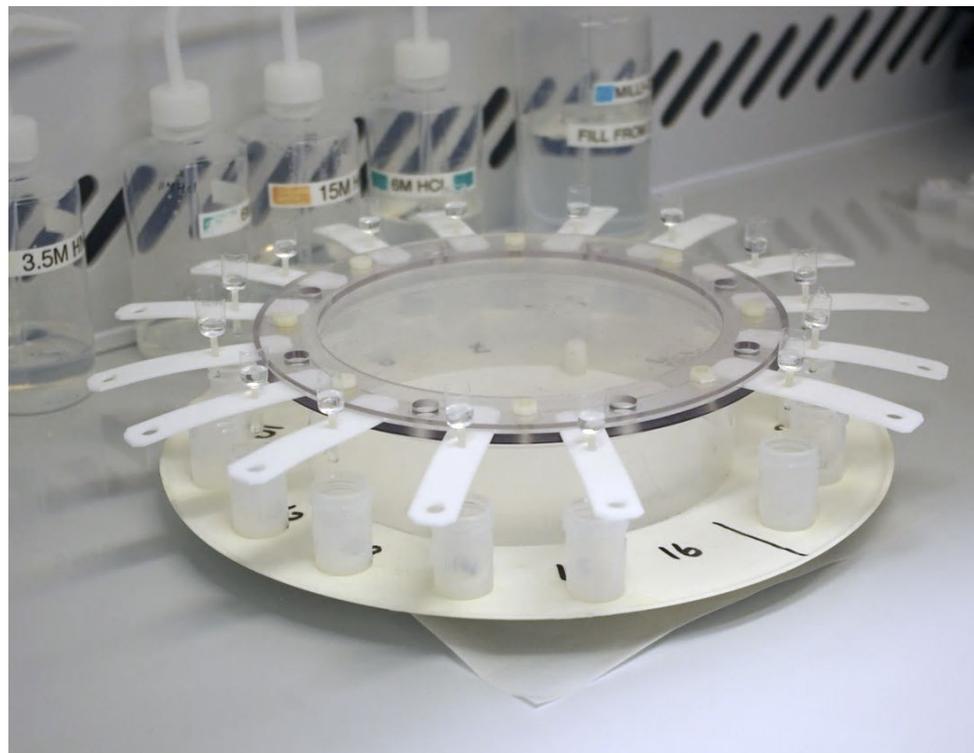
## Laying Out the Columns

The cleaned columns are set up on a rotating tray so that samples and acids can be easily added.



## Transferring Samples onto Columns

Each dissolved zircon sample is loaded onto a separate column. The dissolved sample solution travels down the column stem and through the ion exchange resin.



## Ion Chromatography Column Chemistry

Different quantities and strengths of acid are added to the column in a specific recipe to separately release the Pb and U from the zircon solution. The Pb and U from each zircon are collected into clean beakers.



## Drying Down the Samples

The solutions are then dried on a hot plate and are ready to be loaded into the mass spectrometer.