# Cleaning Procedures for Laboratory Material used for Chemical Preparation/Column Separation in Lead Isotope Analysis

Abbreviations:

* MQ water: Ultrapure water („Milli-Q“ water)
* \*\*\* = triple-distilled

## Cleaning reagent vessels/vials

* Rinse three times with MQ water
* Fill with 6% HNO3, make sure that no air is trapped in beakers/vials, let it sit for at least 1 night
* Empty HNO3, fill with MQ water, let it sit for at least 1 night
* Store until needed

## Cleaning Teflon (“Savillex”) beakers

### Pre-cleaning

* Place beakers in large beaker and fill it with a mixture of lab detergent (e.g., DECONEX) and deinoised water, let it sit for at least 1 night
* Rinse three times with deionised water
* Fill the large beaker with Aqua Regia (4/8 deionised water, 3/8 HCl p.a., 1/8 HNO3 p.a.), let it sit for at least 24 h on a hot plate at approx. 70–80 °C
* Rinse three times with deionised water
* Rinse once with MQ water
* Fill the large beaker with 6N HCl, let it sit for at least 24 h on a hot plate at approx. 70–80 °C
* Rinse three times with MQ water
* Take beakers out of large beaker and let them dry

### Bleaching

* Fill 1 ml 6M HNO3\*\*\* into the individual beakers, screw tightly, leave for at least one week on a hot plate
* Rinse three times with MQ water
* Fill with MQ water and add a few drops of HBr (to bind the lead), leave it for at least one night or until needed
* Dry beakers at least one day before needed (they should be cooled down to room temperature for weighing)
* Store until needed

## Cleaning columns

* Allow columns filled with old resin to dry
* Empty used resin (tap or rinse with water using a pipette repeatedly)
* Rinse with MQ water
* Place in sealable plastic container with a mixture of lab detergent (e.g., DECONEX) and deinoised water (make sure no air is trapped in the columns) and shake closed container
* Rinse three times with MQ water
* Put columns in large beaker filled with Aqua Regia (4/8 deionised water, 3/8 HCl p.a., 1/8 HNO3 p.a.), let it sit for at least 24 h on a hot plate at approx. 70–80 °C
* Rinse three times with MQ water
* Fill the large beaker with 6N HCl, let it sit for at least 24 h on a hot plate at approx. 70–80 °C
* Rinse three times with MQ water
* Take columns out of beaker and store them 5% HCl\*\*\* for at least 1 week or until needed
* Rinse with MQ water before use

## Cleaning new resin (dry product)

* Pour some spoons of resin (e.g., DOWEX AG1x8 or other in use) into a 1 L bottle
* Fill up to approx. 500 ml with MQ water and 10 ml 6M HCl\*\*\*
* Shake several times
* Decant
* Repeat multiple times
* Fill up again with approx. 500 ml of MQ water and 10 ml 6M HCl\*\*\*
* Store like this until needed

These procedures were adopted from the former isotope laboratory of Friedrich Begemann, Max-Planck-Institut für Chemie, Dept. Isotopenkosmologie, Mainz, Germany.