



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

1. Cleaning reagent vessels/vials

- | Rinse three times with MQ water
- ▢ Fill with 6% HNO_3 , make sure that no air is trapped in beakers/vials, let it sit for at least 1 night
- | Empty HNO_3 , fill with MQ water, let it sit for at least 1 night
- | Store until needed

2. Cleaning Teflon (“Savillex”) beakers

2.1 Pre-cleaning

- Place beakers in large beaker and fill it with a mixture of lab detergent (e.g., DECONEX) and deionised 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 HNO_3 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

2.2 Bleaching

- Fill 1 ml 6M HNO_3 *** 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

3. 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 deionised 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 HNO_3 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





4. 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.

