

## BLANK LEVELS IN ISOTOPIC ANALYSES AT THE GEOCHRONOLOGICAL RESEARCH CENTER

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### 1. Introduction

Precise and accurate isotope analyses via mass spectrometry require low blank (picogram levels). Some papers [1,2] suggest that blank values should be < 0.1% of sample content, so that the influence of procedural blank on the isotope ratios would be negligible. The total procedure blank is strongly influenced by the particulate level in the room, reagent purity, labware cleaning, and analyst behavior.

### 2. Geochronological Research Center (CPGeo) clean laboratory

CPGeo's clean labs are equipped with polypropylene-made laminar flow hoods and clean-boxes (class 100) working under temperature and pressure-controlled conditions provided by high-efficiency particulate air system (HEPA, class 10,000) which is periodically certified.

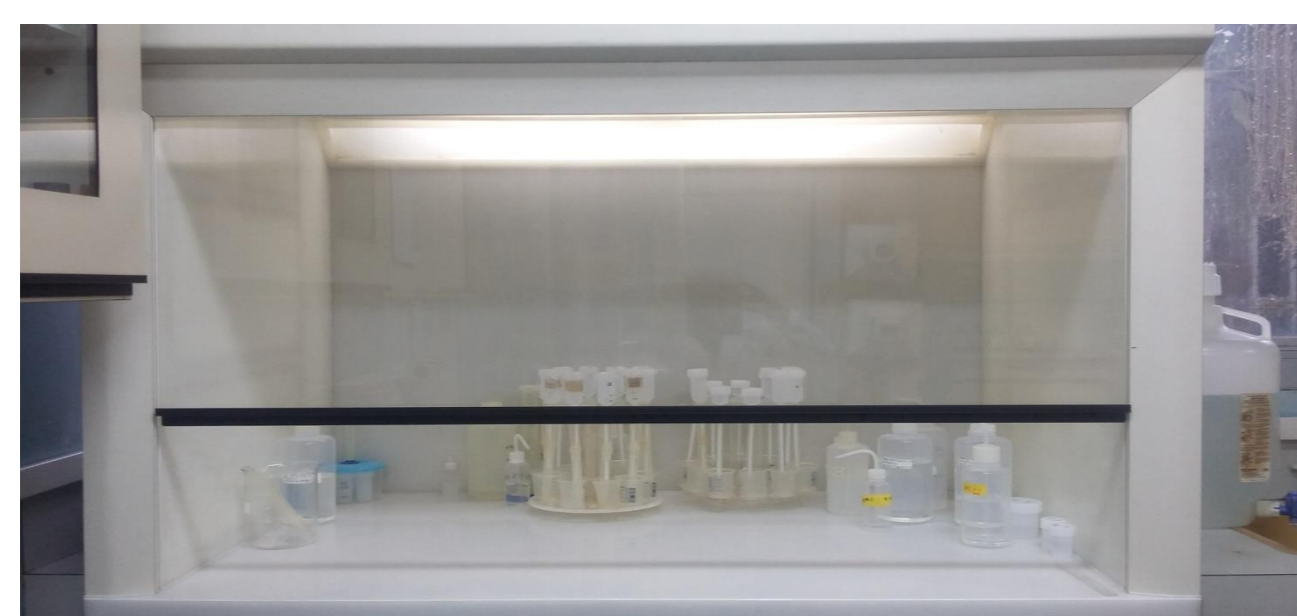


Fig.1 - Class 100 laminar flow hood.



Fig.2 - Class 100 clean box .

### 3. Purification of Reagents

The total procedure blank is strongly influenced by the degree of purification and volume of reagents [3].

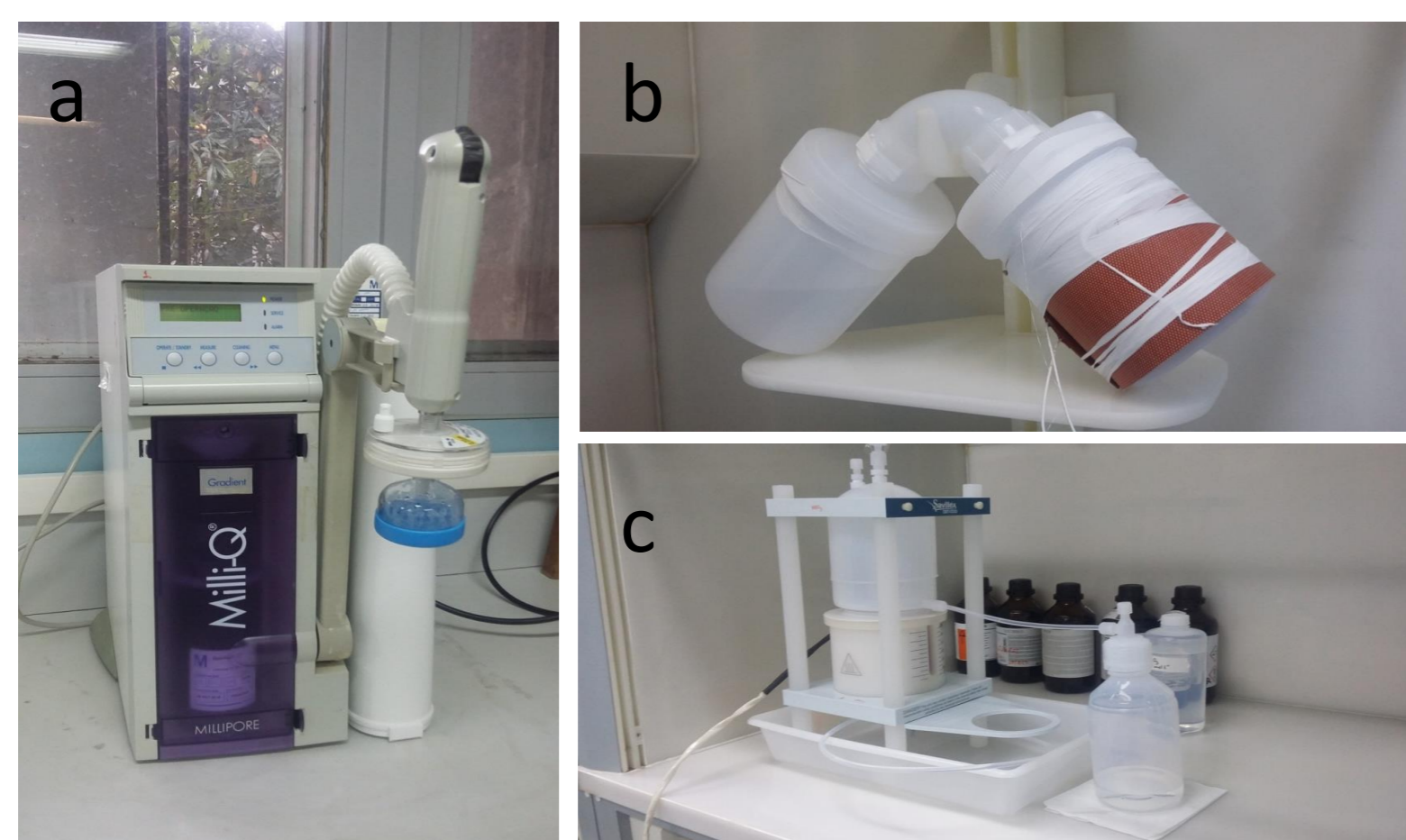


Fig.3 – (a) Milli-Q® water purification system; (b) Savillex® sub-boiling distillation system; (c)Savillex® DST-1000 device

### 4. Labware decontamination

#### a. Tubes and tips



Fig.4 - Tubes and pipette tips sonicated with 50% (v/v) HNO<sub>3</sub> solution 30 minutes before being used.

#### b. Bottles



Fig.5 - Bottles are half filled with the 50% (v/v) HNO<sub>3</sub> solution and heated at 60 °C for a week.

#### c. Savillex® beakers decontamination

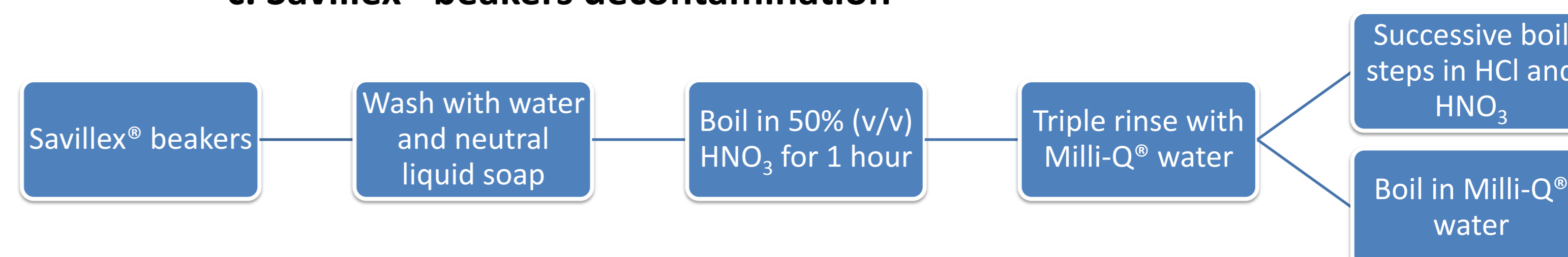


Fig.6 - Savillex® teflon beakers boiling in 50% (v/v) HNO<sub>3</sub>.

### 5. Analyst interference

To keep blank levels as low as possible, the analyst must be aware of his interference on every step of the chemical procedure, carefully handling the samples in order to avoid cross-contamination from other samples.

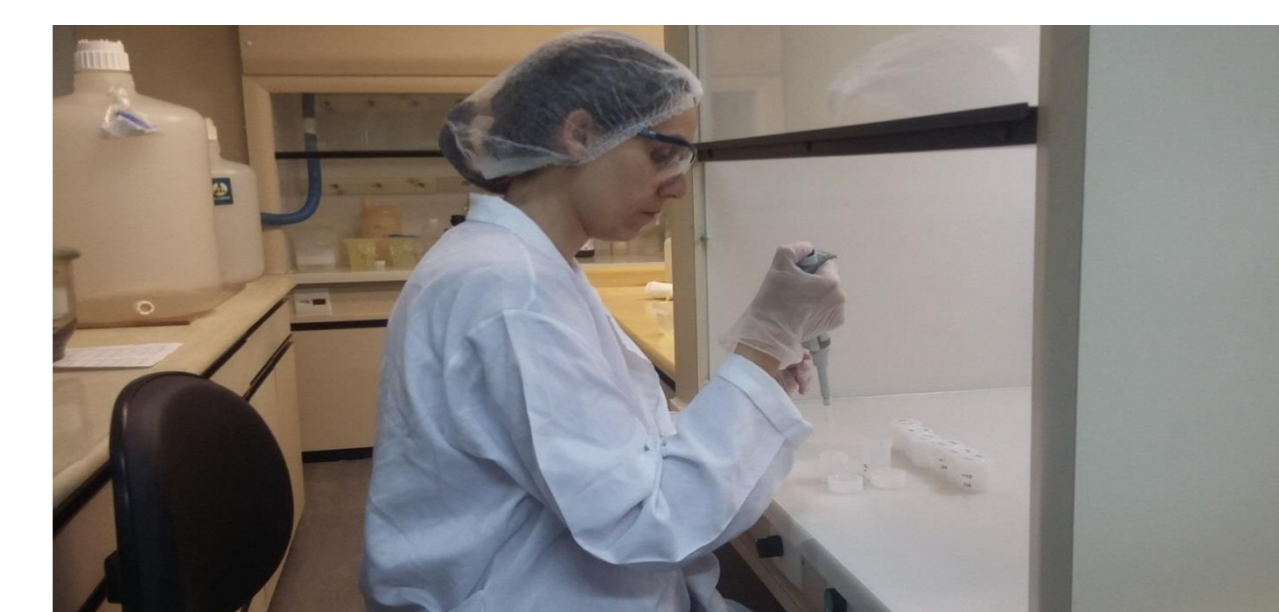


Fig.7 - Analyst using clean coat, cap and gloves.

### 6. CPGeo blank levels

The table 1 shows blank data from other laboratories that deal with isotope analysis.

Table 1- Total blank values obtained by ID-TIMS for whole rock isotope analysis.

Reference	Pb (pg)	Nd (pg)	Sr (pg)
Present work	100	40	100
Yang, 2011 [4]	-	20	-
Saji, 2016 [5]	-	100	-
Taylor, 2015 [6]	75	-	-
Baker, 2004 [7]	80-100	-	-
Avanzinelli, 2005 [8]	-	-	120-300
Takahashi, 2009 [9]	-	-	21-33

### 7. Conclusion

Procedural blank values obtained at CPGeo are in agreement with those measured in other laboratories. Our data are lower than 0.1% of our samples content, so that the influence of procedural blank on the isotope ratios is negligible and no corrections are necessary.

### 8. References

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