

## **CLEAN LABORATORY CONCEPTS IN ULTRA TRACE ELEMENT AND ISOTOPE ANALYSIS**

SCHNEIDER, P.A., Institut für Geologie und Dynamik der Lithosphäre, Göttingen, Germany.

Analytical methods have achieved sensitivity, that makes it nearly impossible to proof their limits of detection under standard laboratory conditions. Clean air contains 1 million, contaminated air up to 10 millions of dust particles per litre (!) larger than 0,1 micron in size. Fine dust particles, that pass electrostatic filters in industrial processes may contain up to a few weight percents of heavy metals, like zinc or lead. Metallic dust particles range from 0,001 micron to about 100 microns in size. Acid fumes, generated in sample digestion and sample preparation processes behave similar to small sized dust particles. Some of these sample preparation processes last for hours or even days. They entail remarkable corrosion processes, resulting in uncontrolled particle generation within the laboratories. This has to be taken into consideration, if processes of sample preparation in ultra trace element analysis and isotope analysis are concerned. Four essentials have to be met: 1. Contamination of dust particles has to be suppressed (Clean Rooms, Clean Air Laminar Flow Workstations). 2. Corrosion in the vicinity of the samples has to be avoided. The release of acid fumes has to be reduced to a minimum. 3. Contamination by vessels used during handling of samples and reagents must be evaded by selecting appropriate materials like PTFE, PFA, etc. 4. Contamination from reagents has to be excluded by additional cleaning procedures, like subboiling distillation of water and acids. Against this background strategies for clean room design and the selection of equipment are discussed.