

Standard Operating Procedure

Operation of Analytical Balances

1. Introduction

1.1. Purpose

To outline the procedure for operation of analytical balances in the TRACES Centre and the undergraduate laboratories. This procedure describes how to accurately weight (directly or indirectly) samples using a digital analytical balance.

1.2. Scope

Applicable to digital analytical balances located in TRACES Centre and UG Laboratory. These include (but not limited to) Sartorius, Ohaus and Mettler-Toldeo brand devices.

1.3. Responsibility

User

1.4. Accountability

TRACES Manager/Course Instructor

2. Referenced Documents

- 2.1. Waegfibel-e-720906.pdf
- 2.2. Sartorius 2019 Guide to Premium Laboratory Balances

3. Equipment

- 3.1. **Analytical Balance**, digital
- 3.2. **Various clean containers**, for liquid or solid transfer
- 3.3. **Transfer utensils**, pipettes, spatula or capillaries

4. Procedures

4.1. Balance Operation

For all purposes of use in the TRACES Centre and undergraduate laboratories, analytical balances must operate in the method chosen by the lab instructor/manual.

Standard Operating Procedure

4.2. Before you start

4.2.1. Level and Zero the analytical balance.

- 4.2.1.1. Level the balance; look at the leveling bubble on the base of the unit. If it not centered, center it by turning the leveling screws on the bottom toward the back of the balance.
- 4.2.1.2. Zero the balance; after the leveling is completed. Close all the balance doors and press the button labelled '**0**' on the front of the balance. Wait until the unit has zeroed- showing a value with all zeros. This indicates that the balance is zeroed and ready for use.

Please consult the TRACES Staff/TA or lab manual for the appropriate weighing option

4.3. Direct Weighing

- 4.3.1. The samples are weighed using an appropriate weighing container weighing paper/beaker
- 4.3.2. Ensure the analytical balance is set to the proper units grams (g), milligrams (mg)
- 4.3.3. Place the weighing container on the balance pan and close the doors.
- 4.3.4. Tare the container (Press '**T**'). The readout will read zero with the container sitting on the pan. This allows the mass of your sample to be read directly.
- 4.3.5. Add the sample to the container; avoid spilling on to the balance.
- 4.3.6. With the sample inside the vessel, close the balance doors and read the display when the mass stabilizes.

4.4. Indirect Weighing (Weighing by difference)

- 4.4.1. Weighing the difference in a tared sample vessel before and after a determined amount of sample is removed.
- 4.4.2. Transfer enough of the sample in a weighing bottle, put the lid on, and place on the scale. Record the mass.
- 4.4.3. Take sample out and place it in a secondary container. Record the new mass. The difference in mass is the mass of the sample transferred.
- 4.4.4. Continue this procedure until the desired mass has been weighed into the secondary container.
- 4.4.5. Transfer small amounts at a time. This will ensure that only the minimal amount of sample is transferred-minimizing waste. Discard excess sample back into the weighing bottle OR waste.

Please consult your lab manual or TRACES Staff/TA for clarification.

5. Cleaning up

- 5.1. Once weighing is completed, ensure you have properly cleaned up any chemicals that may have spilled on or around the balance. Take care not to press down on the pan. Use a brush provided to remove particulates from the pan area.