

Determination of density of paper

The aim of the experiment is to plan and to realize an experiment determining the density of paper as precisely as possible.

Prerequisites

Student should be familiar with the following topics: the notion of density, the principles of length and mass measurements, the principles of measurement error determination.

Apparatus

Ruler, caliper, micrometric screw, several single sheets of paper, laboratory scales.

The method

Student is supposed to propose a paper density measurement methods, present formulas used for calculation and analyze the precision of the result obtained. Particular attention should be given to the possibilities of increasing the precision of the final result.

Course of experiment

The course of the experiment depends on the measurement methods proposed by the student.

Report

The report should contain:

1. Description and explanation of the measurement method chosen.
2. Formulas and used in the calculations.
3. Description of the method of uncertainty determination (taking into account the precision of the measurement tools used).
4. The results (paper density values) together with corresponding uncertainties.
5. Conclusions — student should describe the dependence of the uncertainty of the result on the measuring procedure (measurement of single sheet as opposed to measurement of several sheets) as well as the influence of individual sheet measurements (length and width, thickness and mass) on the uncertainty of the final result.