

Precision vs. Accuracy and Density

1. Below are four sets of data obtained by students in a CHM 151 lab. The small metal object that was weighed has an actual mass of 25.11 g. Comment on the *accuracy* and *precision* of the data sets.

Data Set 1	Data Set 2	Data Set 3	Data Set 4
24.06 g	25.12 g	23.76 g	26.51 g
28.09 g	25.09 g	23.80 g	25.08 g
29.56 g	25.14 g	23.78 g	23.63 g

Data Set 1: Neither accurate nor precise

Data Set 2: Accurate and precise

Data Set 3: Precise, but not accurate

Data Set 4: Accurate (based on average), but not precise

2. In the CHM 151 lab, you are asked to determine the density of the metal object from problem 1. Describe/discuss a simple experimental method for determining its density.

Weigh the metal object. Choose an appropriate sized graduated cylinder so that the metal fits inside the cylinder. Fill the cylinder approximately halfway with water. Record the volume of water. Add the metal object to the cylinder and water without splashing. Record the volume of the water plus metal. Subtract the initial volume of the water from the volume of the water + metal to determine the volume of the metal. Calculate the density of the metal by dividing its mass by its volume.