

# CH1102

Chemistry Laboratory I

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## Assignment-1

**Expt. No. 1: Determination of Density of a Substance:  
Understanding of Precision and Error Analysis**

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## 1 Question 1.

### **What is the difference between error and uncertainty?**

Uncertainty: Uncertainty of a measured value is an interval around that value such that any repetition of the measurement will produce a new result that lies within this interval. This uncertainty interval is assigned by the experimenter following established principles of uncertainty estimation.

Uncertainty, rather than error, is the important term to the working scientist. In a sort of miraculous way uncertainty allows the scientist to make completely certain statements.

Error refers to the disagreement between a measurement and the true or accepted value.

## 2 Question 2.

When do we say a measurement to be –

- a) Precise
- b) Both Precise and Accurate
- c) Neither Precise nor Accurate

For explaining this, I would like to take help of a diagram :-

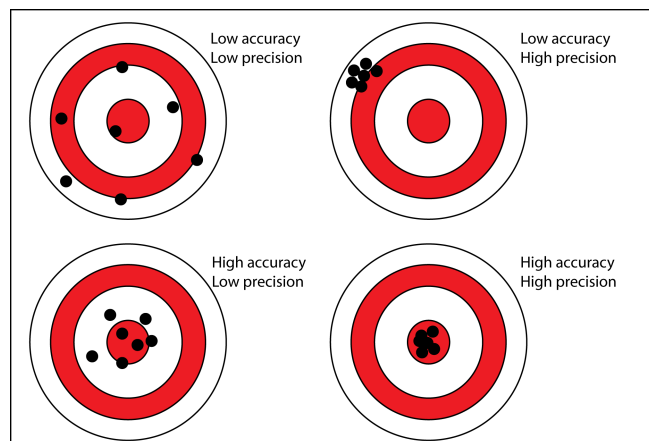


Figure 1: Precision and Accuracy

Accuracy is how close a measured value is to the actual (true) value.

Precision is how close the measured values are to each other.

Therefore,

- a) We call a measurement to be precise, when it is close to the actual, or theoretical value.
- b) A measurement is both precise and accurate when the value is close to the actual value as well as the data points are close to each other.
- c) A measurement is neither precise nor accurate when the values are neither close to each other, nor close to the actual value.