

Answer on Question #77298, Chemistry / General Chemistry

Question:

Four length measurements were taken in lab: 4.02 m, 4.00 m, 4.06 m and 4.05 m.

Are these measurements accurate, precise, neither, or both?

Solution:

Please note that accuracy and precision depend on custom needs!

Considering 1% limit:

The average value: $(4.02 + 4.00 + 4.06 + 4.05) / 4 = 4.0325$ m

The accuracy depends on the actual value of measured length.

If it is 4.00 m, then the error is 0.0325 m, and this is <1% of 4.00 m.

So we can say that the measurements are accurate enough.

The precision depends on standard deviation from the average value.

The calculated standard deviation: 0.0238 m, and this is <1% of 4.0325 m.

So we can say that the measurements are precise enough.

Answer:

Both accurate and precise (<1%)