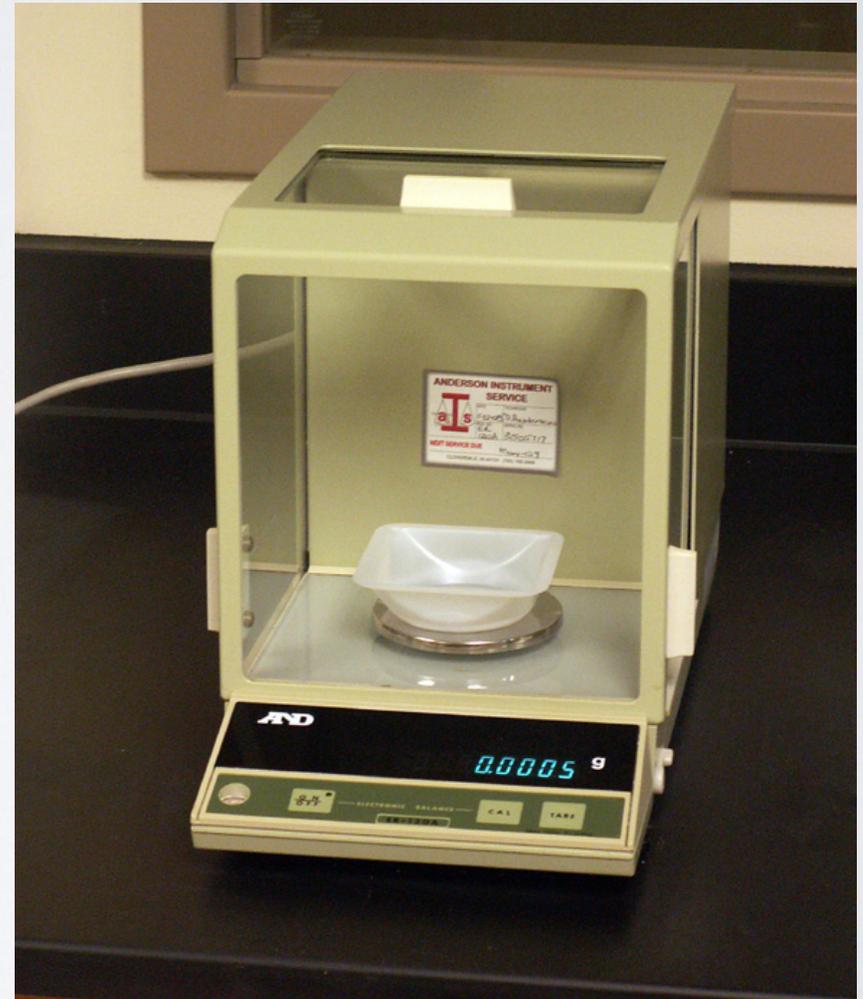


SIGNIFICANT FIGURES

CHEM 25 | SDSU

SIGNIFICANT FIGURES

- The number of figures/digits reported in an analysis needs to reflect the accuracy of the instruments used.
- Reporting more figures/digits in a result gives the reader of the data incorrect information about the precision of the analysis.



DETERMINING SIGNIFICANT FIGURES

- The determination of significant figures is straightforward with analytical equipment, **the last significant figure is the first figure of uncertainty in the reported value.**
- With a buret, the first uncertain figure is the second decimal place. In photo that uncertainty would be 24.81 mL.



SIGNIFICANT FIGURES

- If the uncertainty is available for all measurements in an analysis, the total (propagated) uncertainty of the analysis should be used to determine the last significant digit.
- Always use the absolute uncertainty in determining the last significant digit.
- The first digit of uncertainty is the last significant digit.
- For example: 23.4134 ± 0.0047 mL
should be reported as $23.41\text{\underline{3}} \pm 0.00\text{\underline{5}}$ mL

SAMPLE CALCULATION

A stock solution of HNO_3 has a concentration of 1.025 ± 0.004 M. A 10.107 ± 0.006 mL aliquot is taken from this solution and diluted to volume in a $250 \text{ mL} \pm 0.04\%$ volumetric flask.

What is the uncertainty and final concentration of HNO_3 in the 250 mL volumetric flask?