

GENERAL CHEMISTRY STANDARD 1.5

1.5: Identify the appropriate measuring device for a specific problem and count the number of significant figures in a measurement

SIGNIFICANT FIGURES

- **Significant Figures** – the digits of a quantitative measurement
 - Communicate level of precision of the measurement
 - Important for scientific communication
 - Necessary in peer review
- Rules for counting significant figures
 - All nonzero digits are significant digits
 - All leading zeroes are not significant digits
 - All trapped zeroes are significant digits
 - All trailing zeroes are significant digits only if the decimal point is present

1.5: Identify the appropriate measuring device for a specific problem and count the number of significant figures in a measurement

SIGNIFICANT FIGURES EXAMPLES

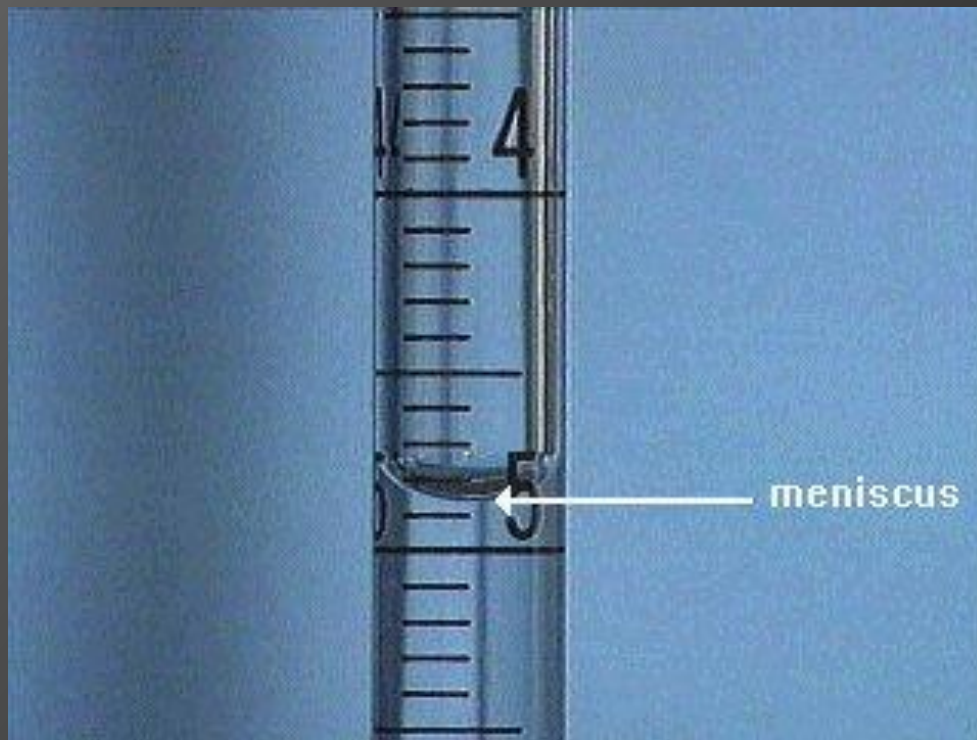
Counting Significant Digits

5495	Four Significant Digits
132.55	Five Significant Digits
1350	Three Significant Digits
0.035	Two Significant Digits
1350.05	Six Significant Digits
300	One Significant Digit
300.	Three Significant Digits

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USING GRADUATED CYLINDERS

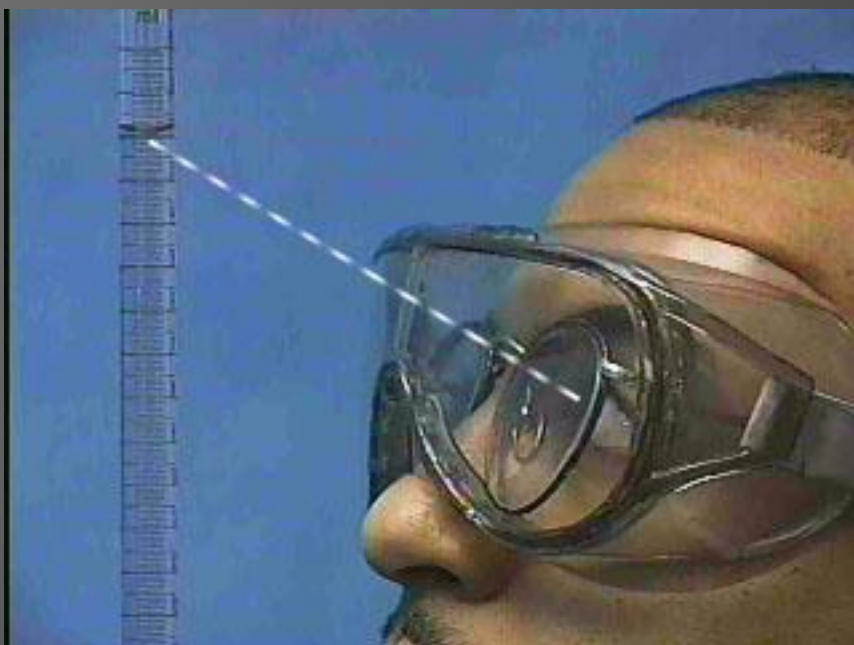
Always read volume from the bottom of the meniscus. The meniscus is the curved surface of a liquid in a narrow cylindrical container.



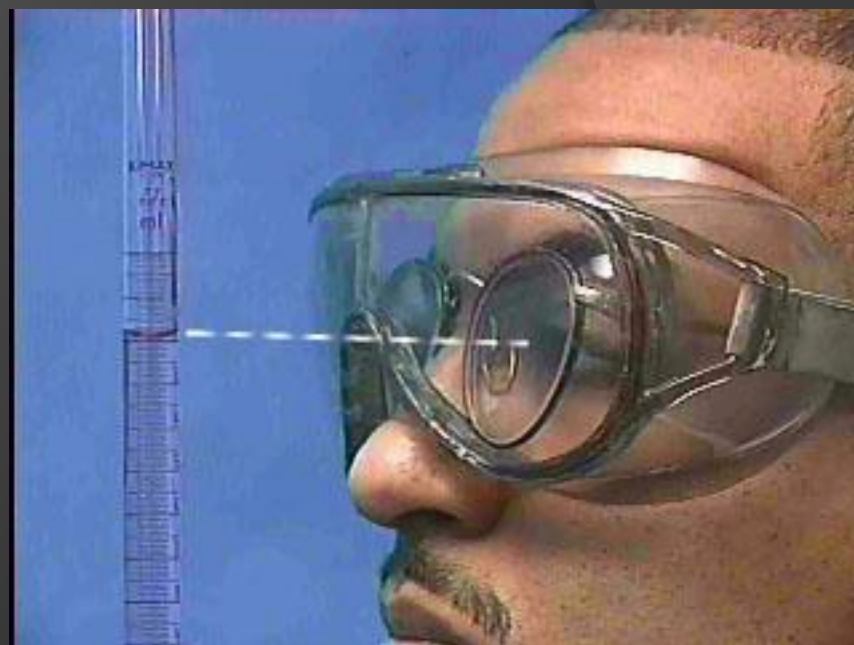
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USING GRADUATED CYLINDERS

Parallax errors arise when a meniscus or needle is viewed from an angle rather than from straight-on at eye level.



Incorrect: Viewing the meniscus from an angle



Correct: Viewing the meniscus at eye level

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MEASURING VOLUME

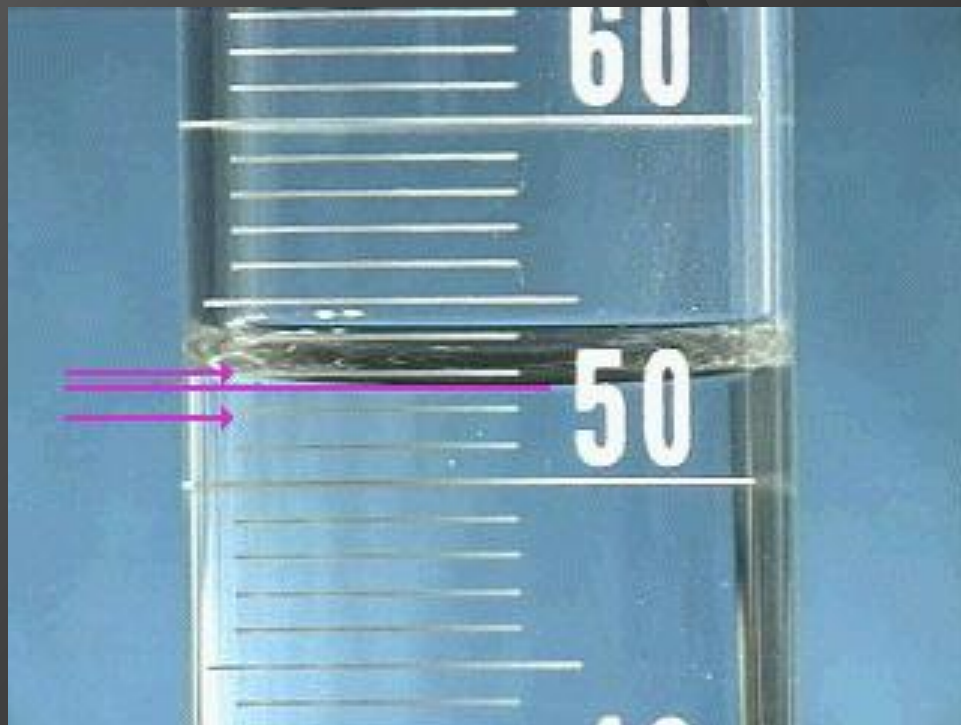
- Determine the volume contained in a graduated cylinder by reading the bottom of the meniscus at eye level.
- Read the volume using all certain digits and one uncertain digit.
 - Certain digits are determined from the calibration marks on the cylinder
 - The uncertain digit (the last digit of the reading) is estimated

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MEASURING VOLUME

There are two unlabeled graduations below the meniscus, and each graduation represents 1 mL, so the certain digits of the reading are 52 mL

The meniscus is about eight tenths of the way to the next graduation, so the final digit in the reading is **52.8 mL**

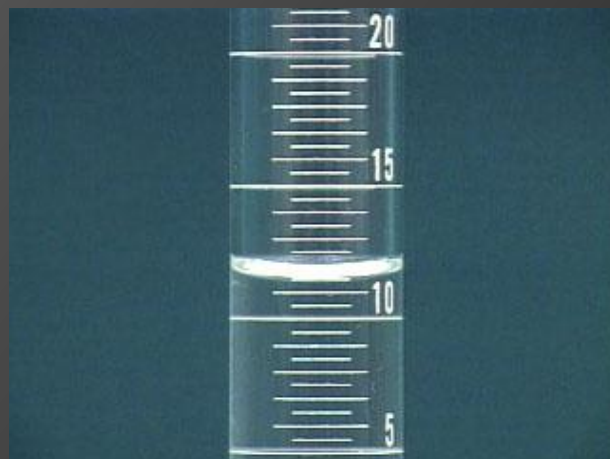


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MEASURING VOLUME

This volume measurement is

6.62 mL



This volume measurement is

11.5 mL

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USING A THERMOMETER

Do not allow the tip to touch the walls or the bottom of the flask.

If the thermometer bulb touches the flask, the temperature of the glass will be measured instead of the temperature of the solution. Readings may be incorrect, particularly if the flask is on a hotplate or in an ice bath.



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