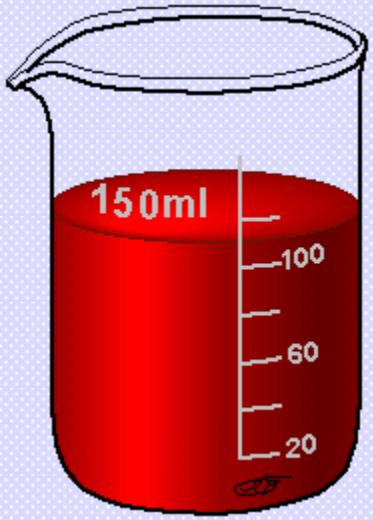
Common Laboratory Glassware and Volumetric Glassware

Prepared By
Michigan Department of Environmental Quality
Operator Training and Certification Unit

GLASSWARE

Erlenmeyer Flask

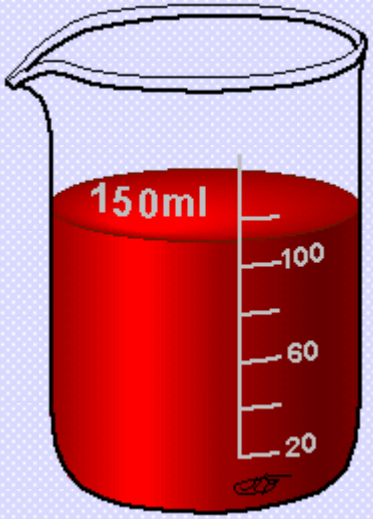


Griffin Beaker

Graduated Cylinder

Graduated Pipet

GLASSWARE



Griffin Beaker

Approximate Graduations

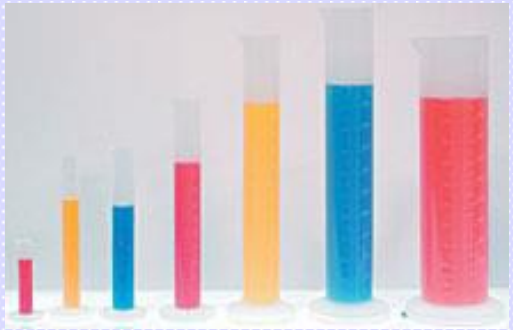
GLASSWARE

Erlenmeyer Flask

Approximate Graduations

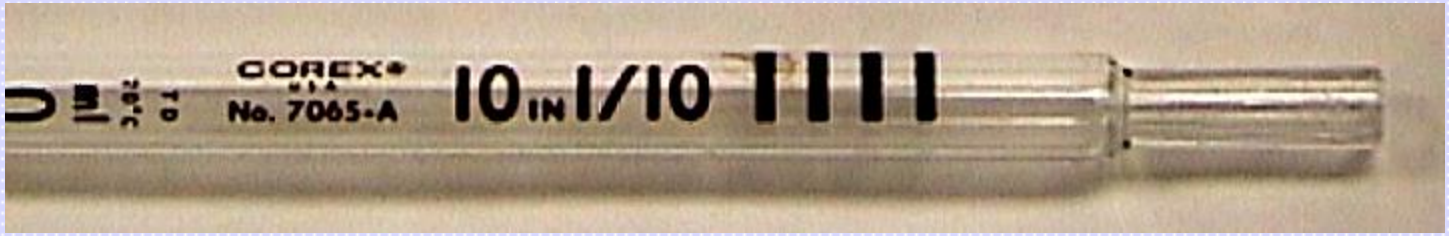
GLASSWARE

Graduated Cylinder



Used for Routine Volume Measurements of 25 mL or Greater

GLASSWARE

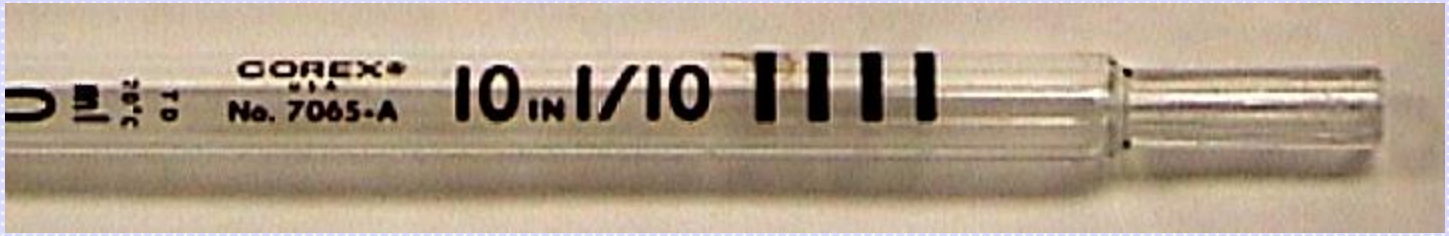


Used for Routine Volume Measurements of 25 mL or Less

Graduated Pipet

GLASSWARE

Wide Tip
Use When Solids in Sample



NOT VOLUMETRIC

Graduated Pipet

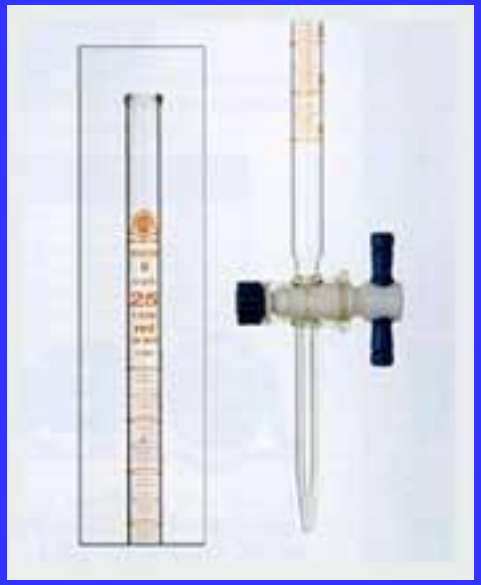
Volumetric Glassware

Required for High Accuracy and Precision

Required When Preparing or Using Standard Solutions

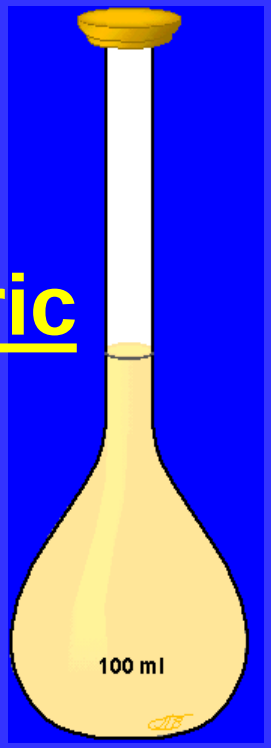
Volumetric Glassware

Accuracy and Precision
Standard Solutions



Buret

Volumetric Flask

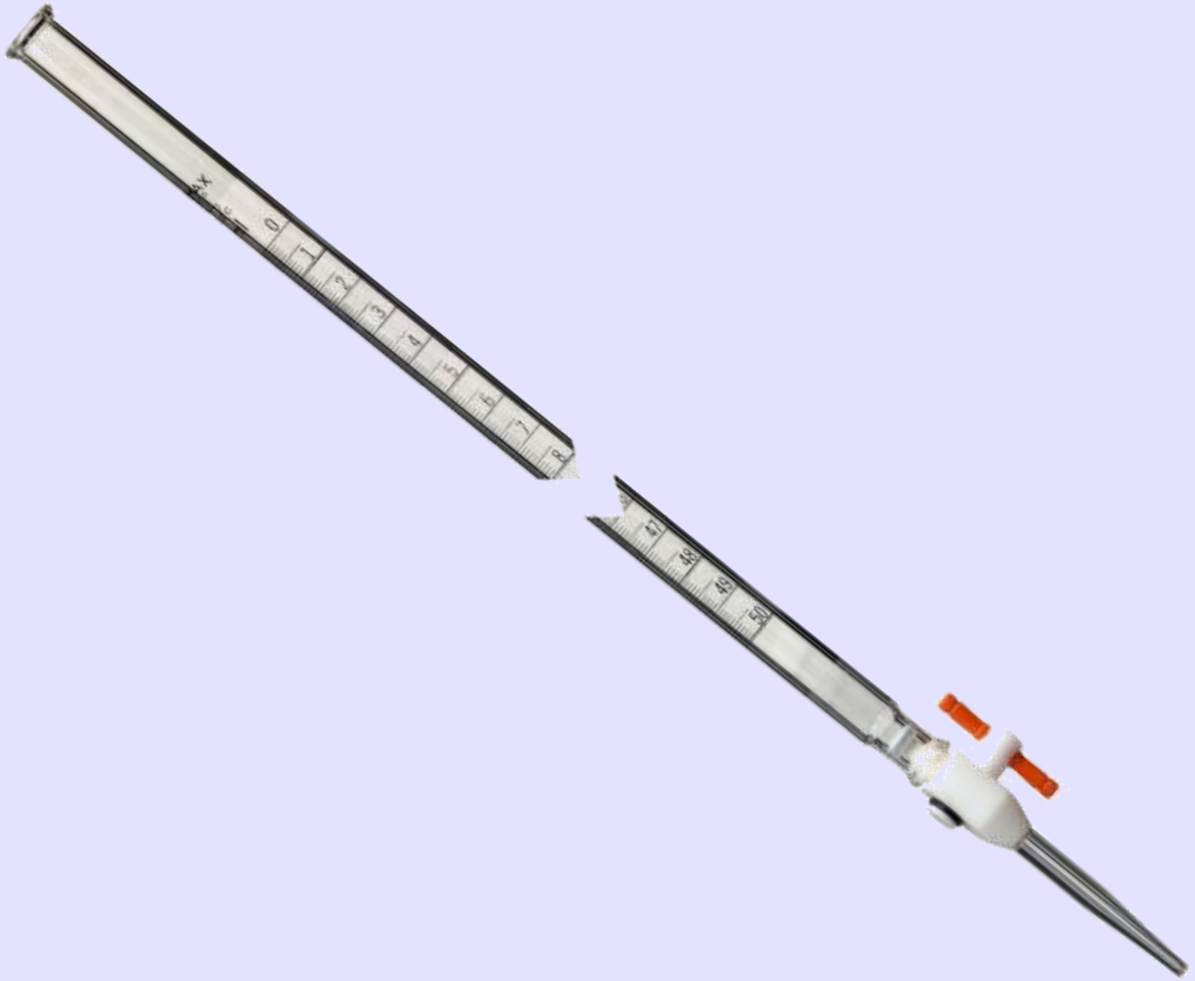


Volumetric Transfer Pipet

VOLUMETRIC GLASSWARE

Must Be Used Properly

BURET

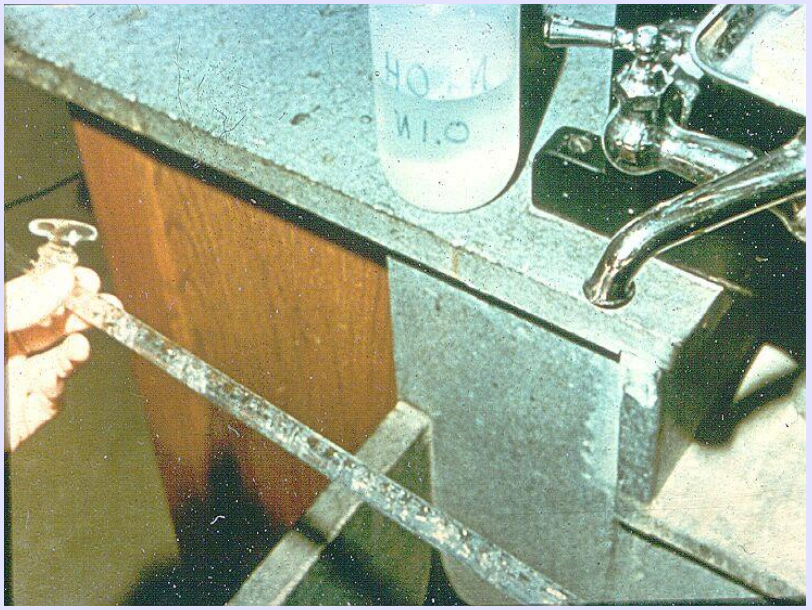


BURET

To Deliver

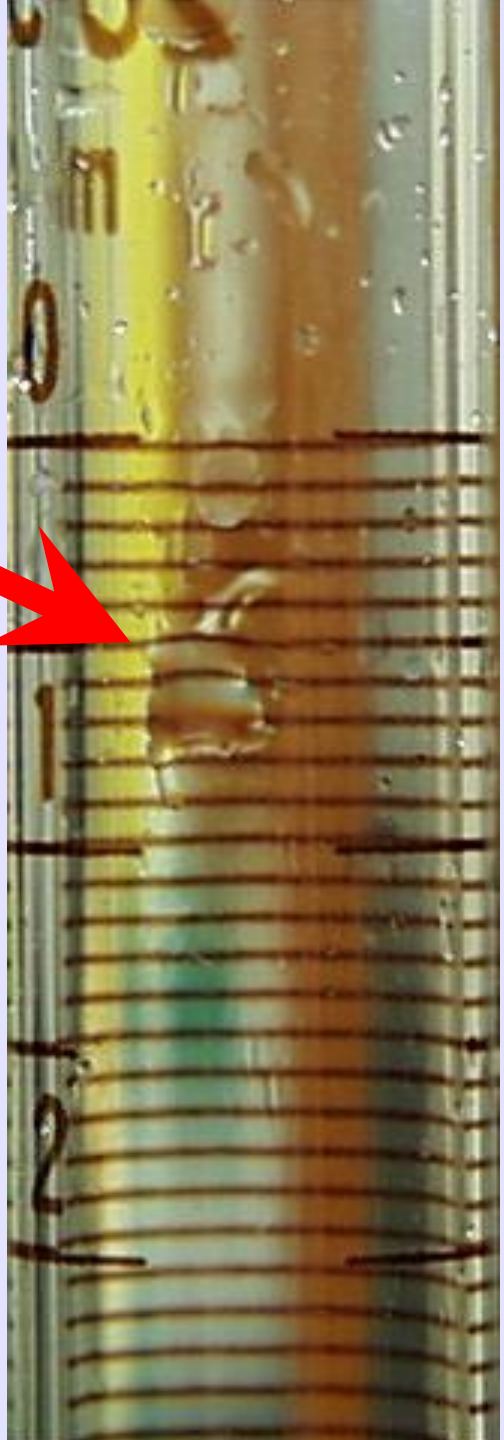
Calibration Temperature

Rinse With Titrant

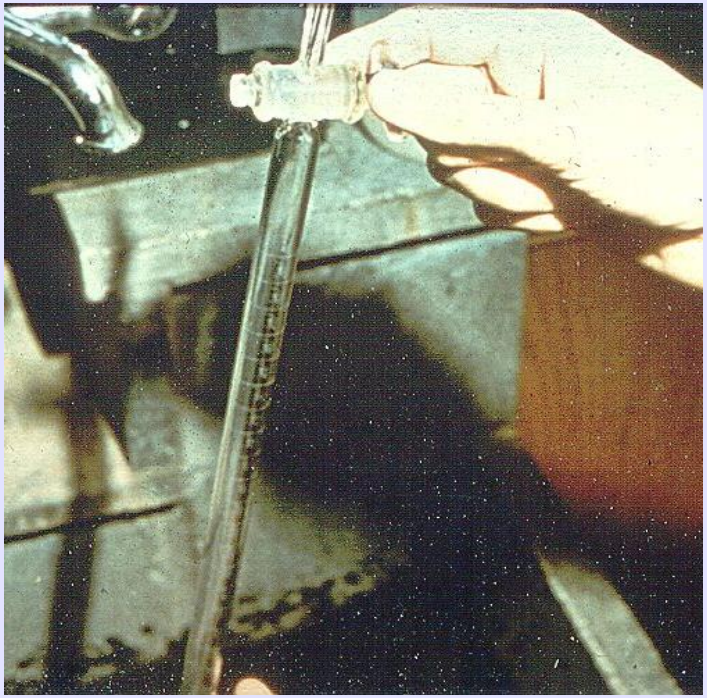


Completely Coat Inside Surface

Beads of Liquid



Not Clean



Rinse Three Times

Fill to Above Top Graduation

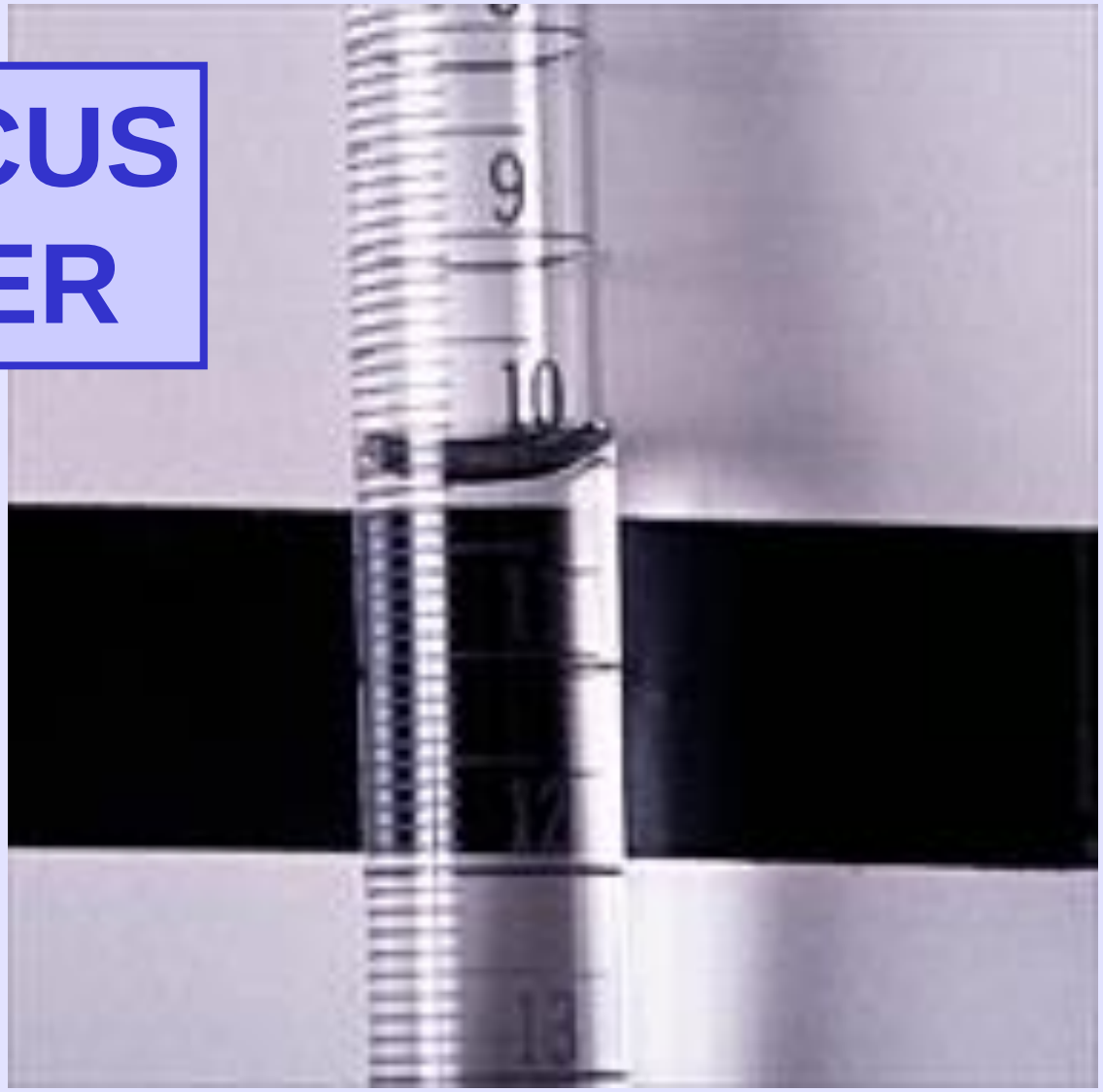
Discharge All Air Bubbles

Drain Until Top of Liquid Is In Graduations

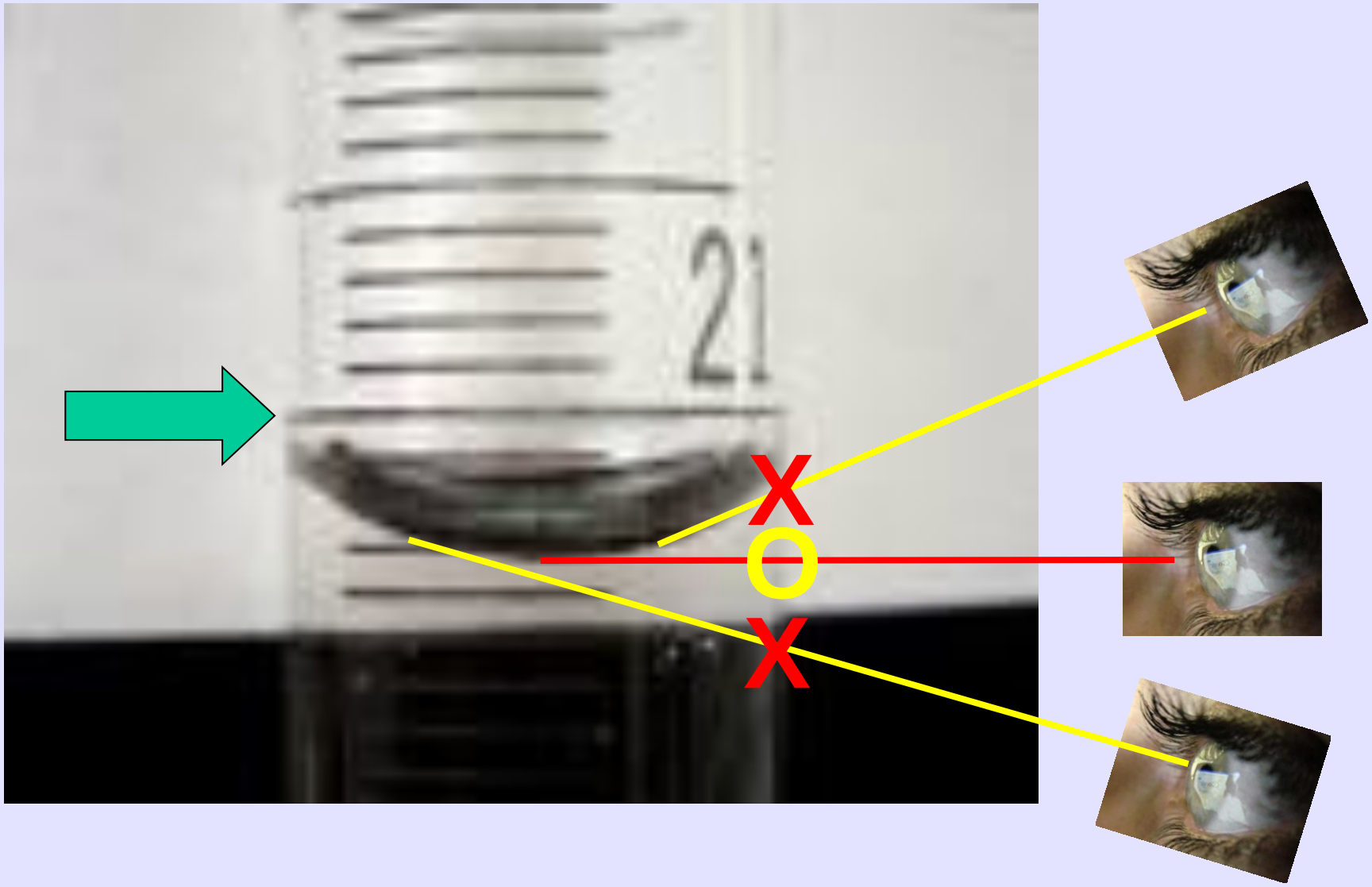
Curved Surface of Liquid

MENISCUS

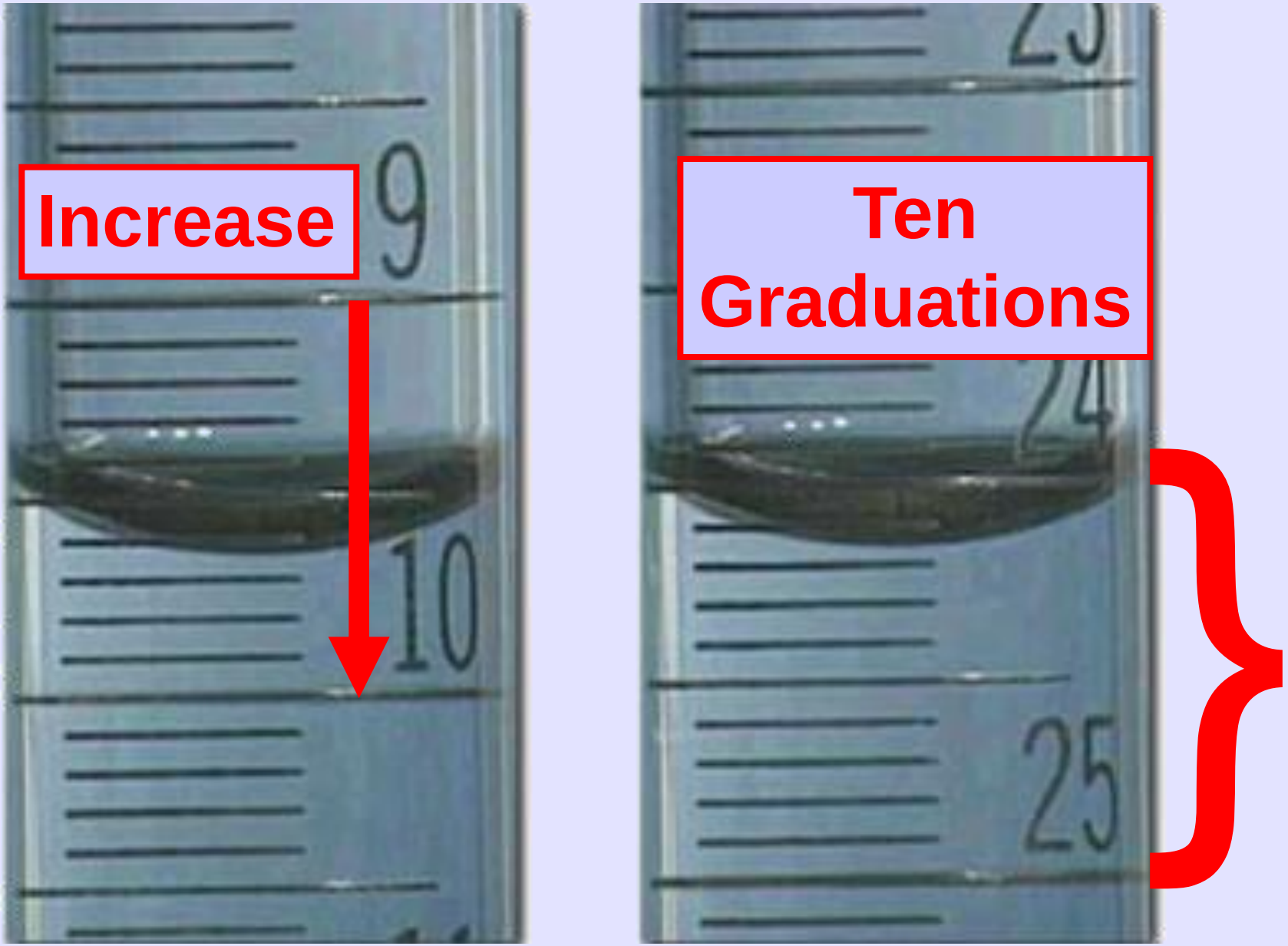
MENISCUS READER



Proper Reading

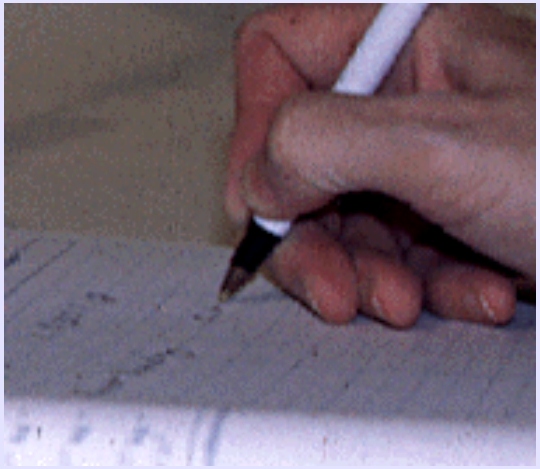


Bottom of Meniscus to Top of Graduation


Increase
9
10
Ten
Graduations
24
25


9.64
9
10


24.16
24
25



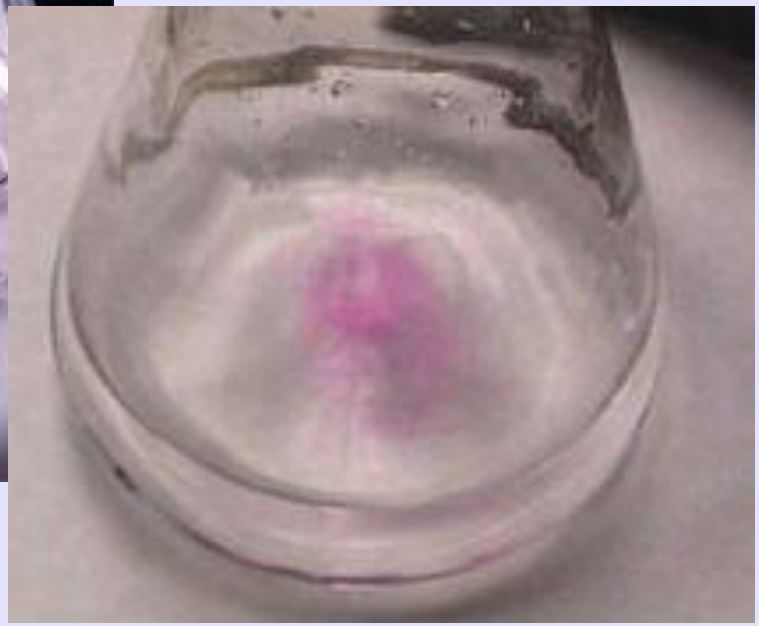
Record Initial Reading

Add Indicator

Proper Grip

Mix Well

Near Endpoint

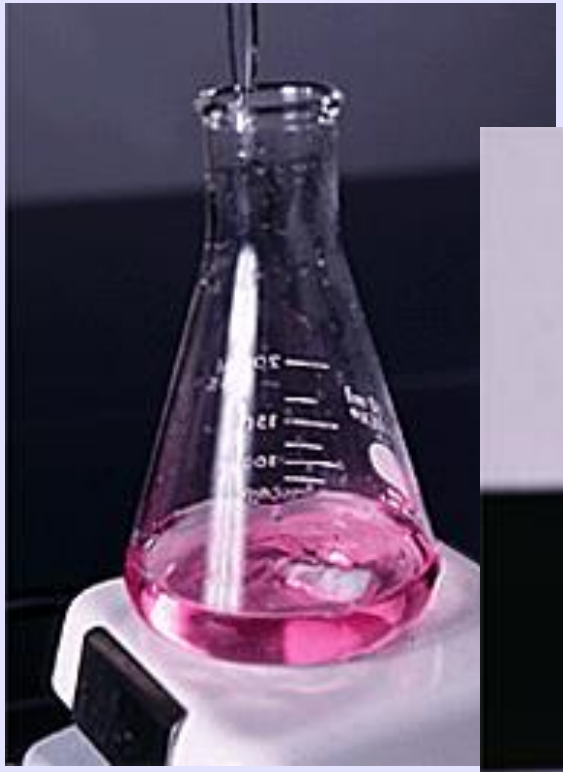


Split Drops

Transfer To Flask

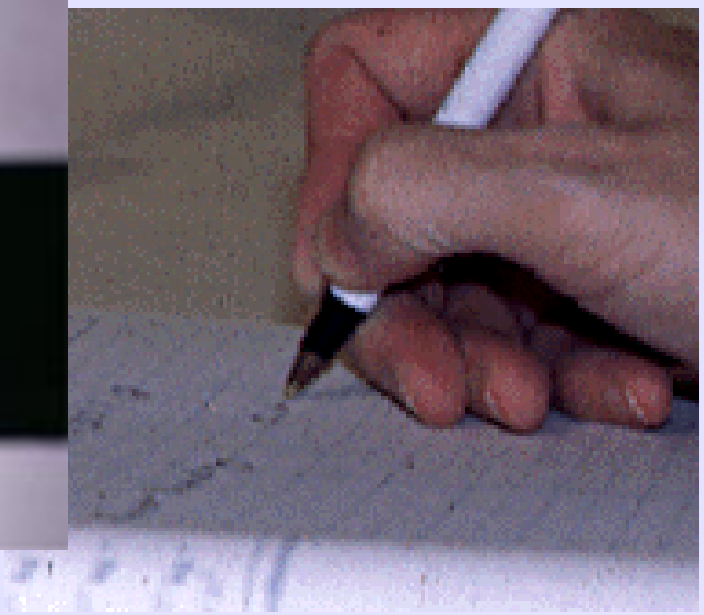
Rinse Into Reaction

At Endpoint

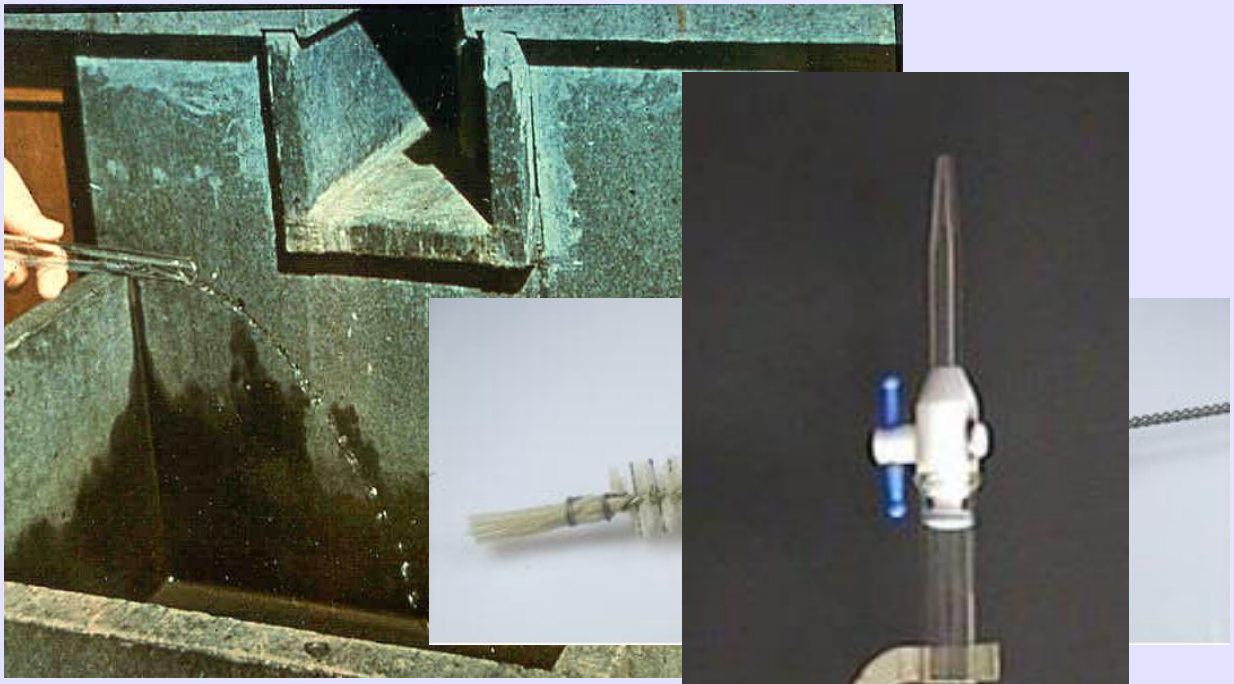


Read

Record Final Reading



Final Reading – Initial Reading = Volume Delivered



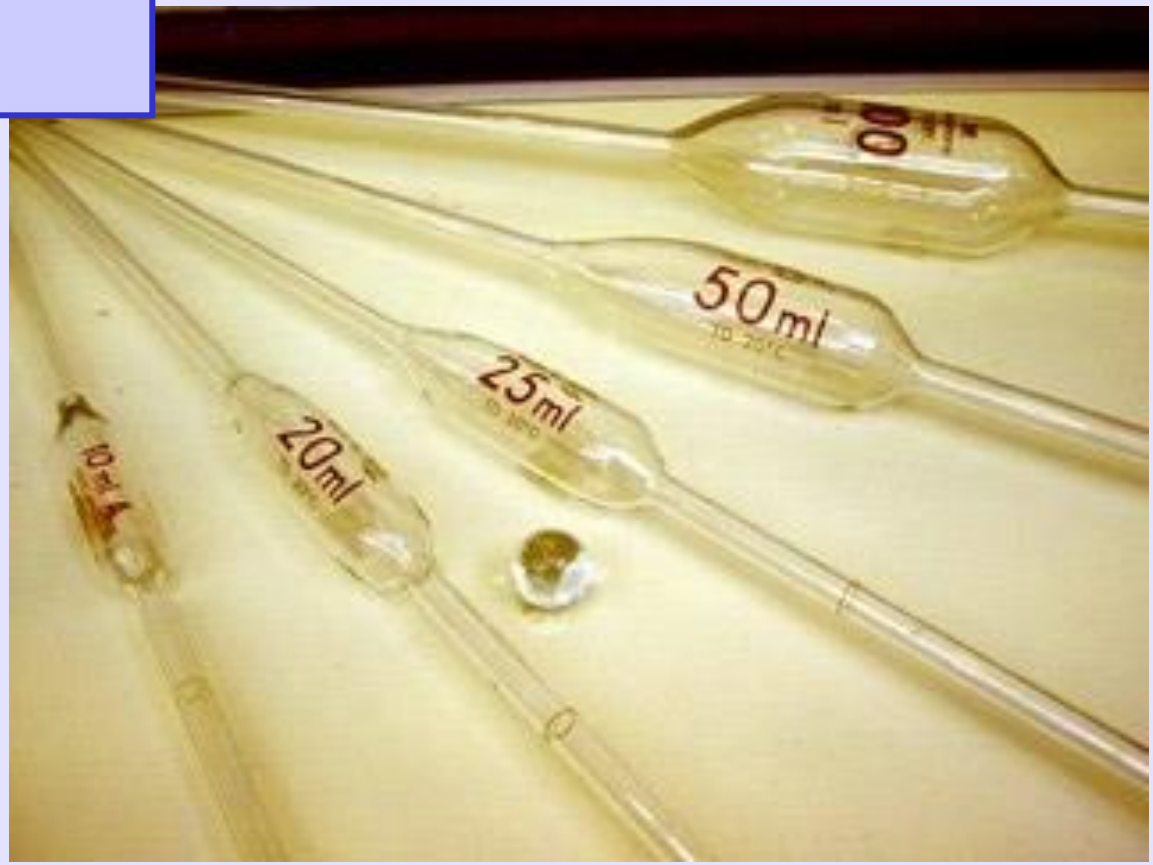
Properly Dispose Excess

Properly Clean

Air Dry

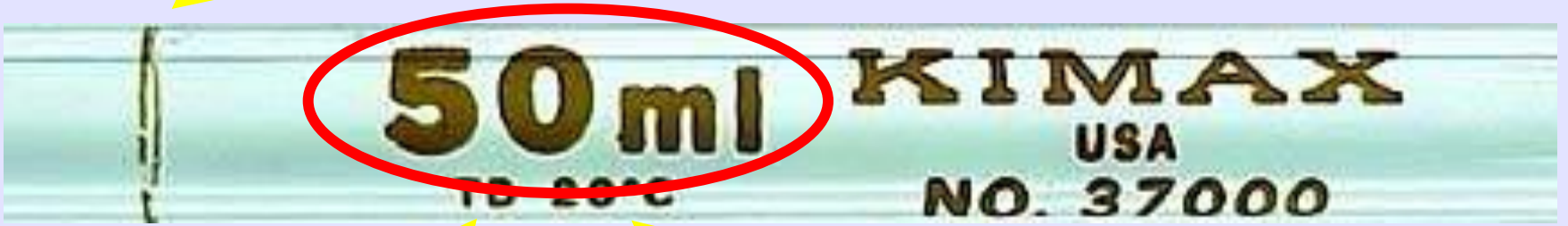
Proper Storage

Volumetric Transfer Pipets



Volumetric Transfer Pipets

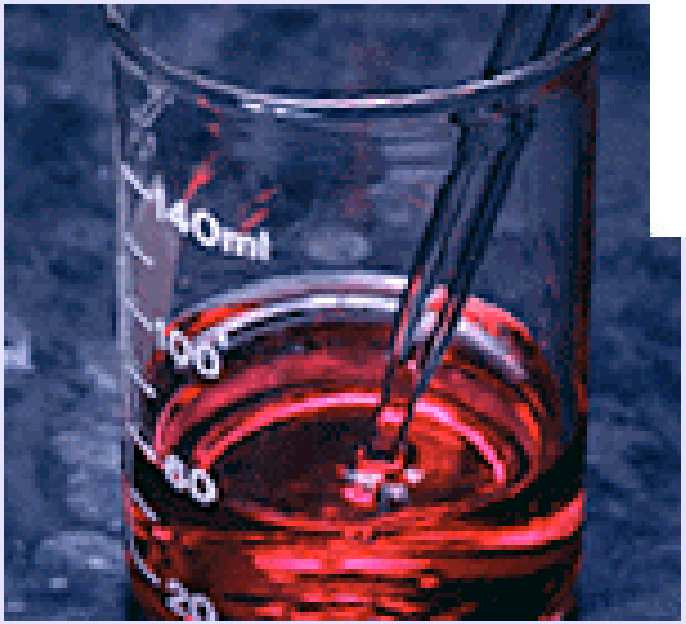
One Calibration



To Deliver

Calibration Temperature

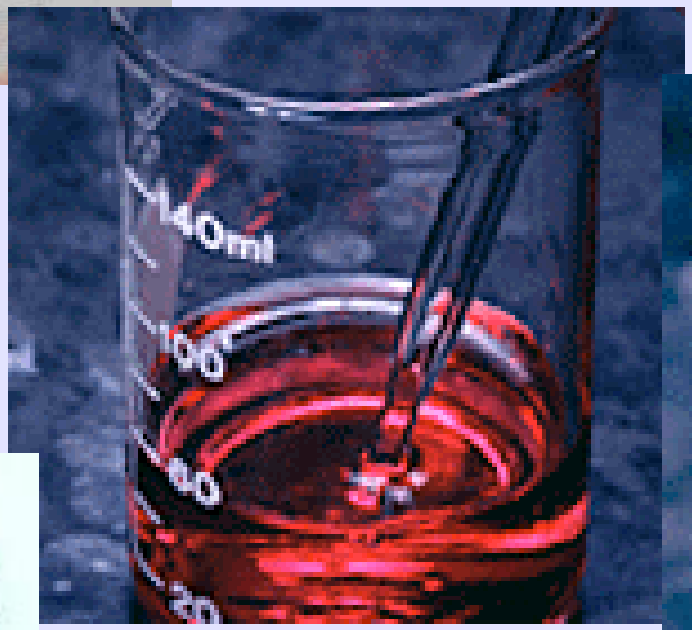
Fill By Vacuum

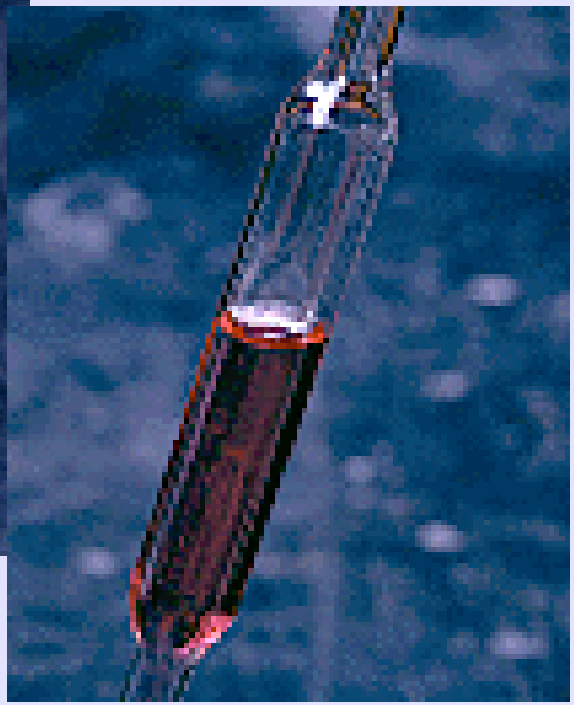


Fill By Vacuum

Rinse

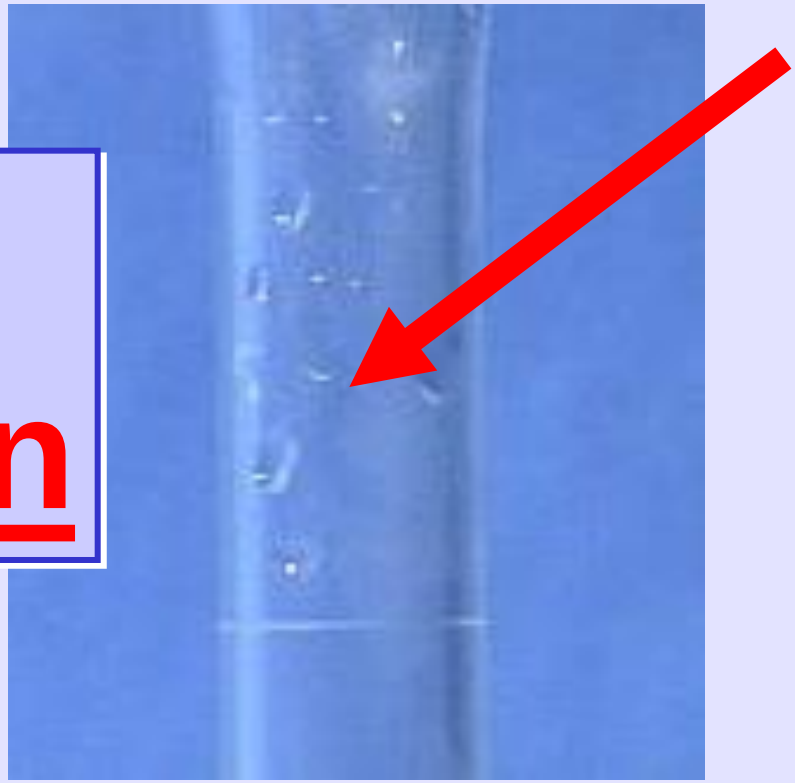
Pipet Bulb





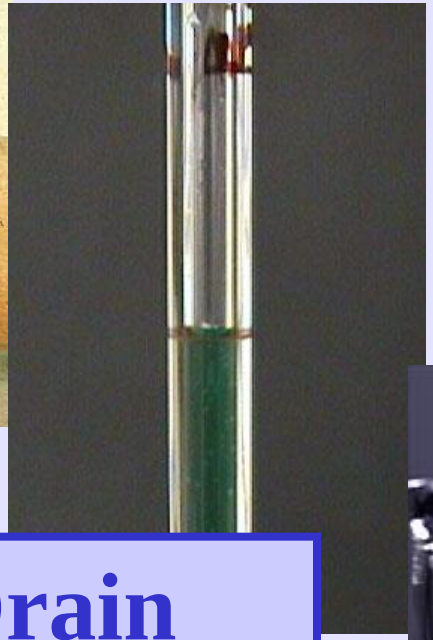
Must Drain Evenly

Not Clean



Wipe Tip

Touch Container To Remove Drop



Fill Above Calibration

Drain To Calibration

Allow To Drain

Touch Tip To Flask

Some Will Remain In Tip

Exception

NOT Painted

ETCHED Ring

FOR BLOW-OUT

Properly Clean

Air Dry

Using Volumetric Pipets

1. **Rinse with solution to be pipeted**
   (Observe for even draining)
2. **Fill to above graduation**
3. **Wipe off outside of pipet**
4. **Drain to graduation**
   (bottom of meniscus to top of graduation)
5. **Touch tip to waste vessel**
6. **Transfer by gravity**
   (vertical - don't force)
7. **Touch tip to inside of receiving flask**

(clean pipet)

Volumetric Flasks

TC

To Contain

NOT Intended To Deliver

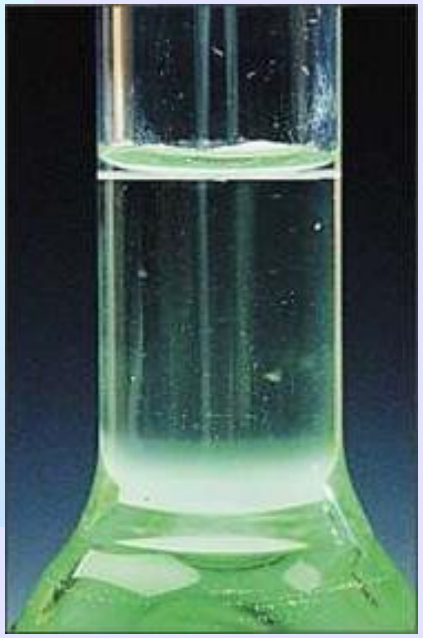
To Prepare Solutions
With Accurately Known Concentration

Fill Half And Mix

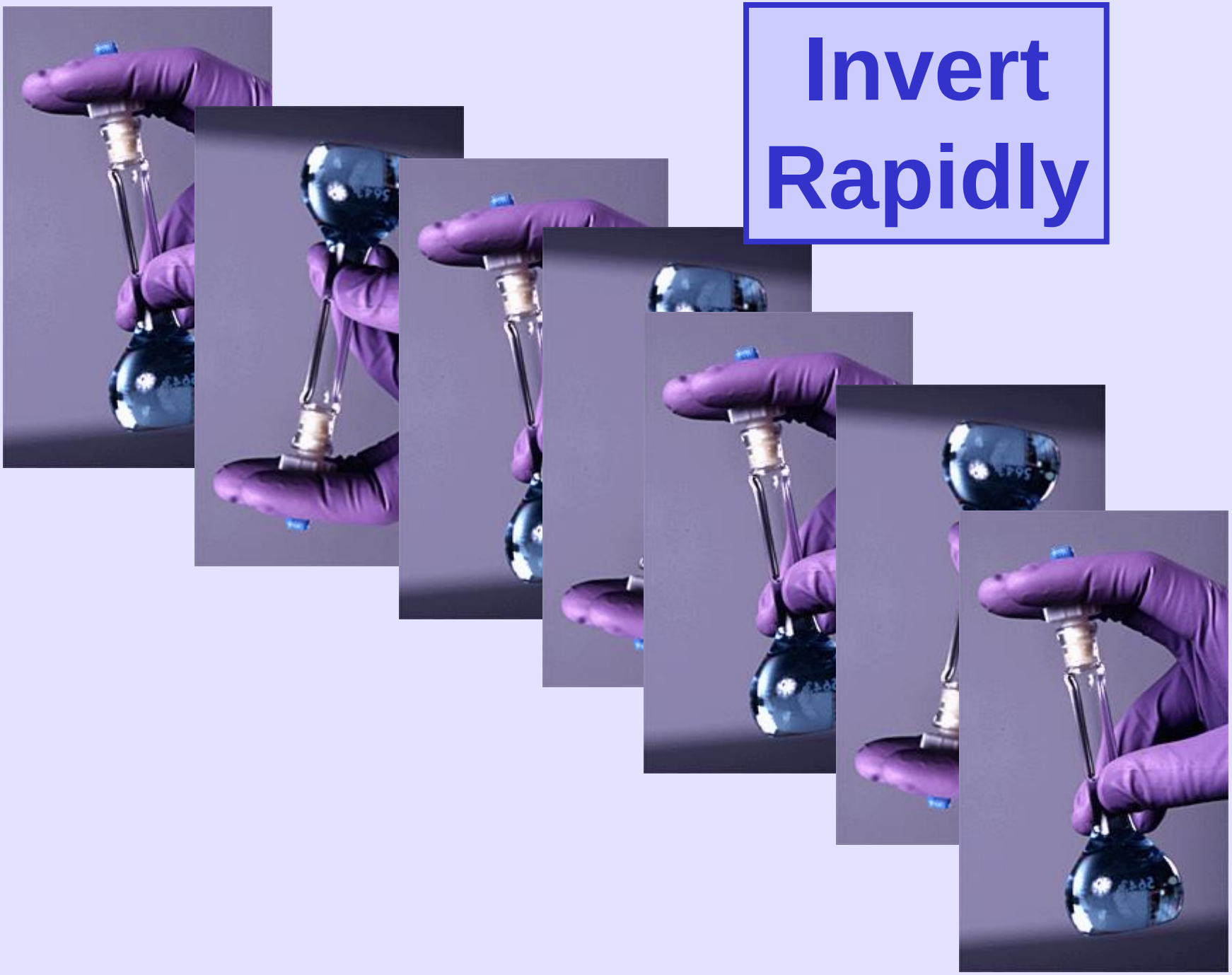
Fill To Below Graduation

Fill Drop-wise

To Calibration



Invert Rapidly



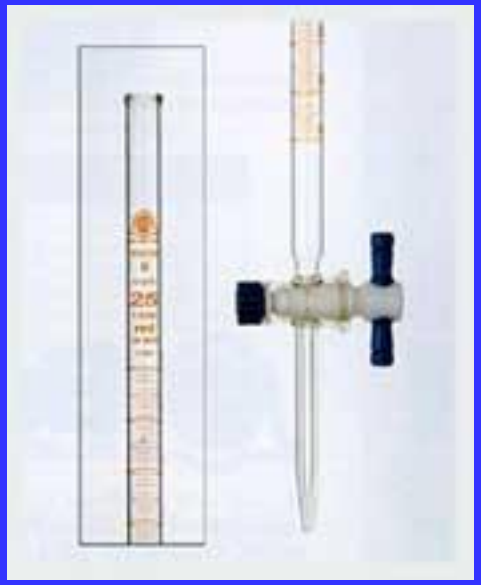
Properly Clean

Transfer To Reagent Bottle

Air Dry

Volumetric Glassware

Accuracy and Precision
Standard Solutions



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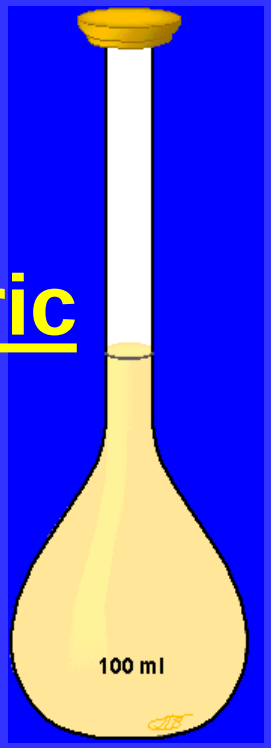

Volumetric Transfer Pipet

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