



زانكۆی سه‌لاحه‌دین - هه‌ولێر
Salahaddin University-Erbil

University of Salahaddin-Hawler

College of Education-Chemistry Department

Practical Representative Elements, Second Stage

Prepared by: MCS. Rezan Ali Saleh

Phone number: 0750...

College of Education-Chemistry Department

(rezan.saleh@su.edu.krd) 2023-2024

University of Salahaddin-Hawler

Week 1

- Error
- Classes of Errors



Error:

Error refer to the **difference** between a **measured** value and **true** value



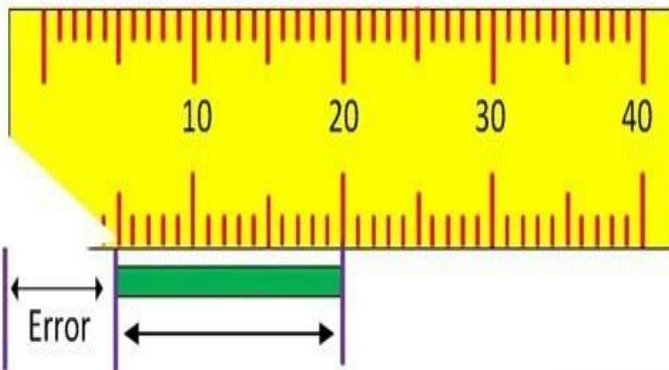
Classes of Errors

- **1-Determinate Errors (Systematic Errors)**
 - A-Instrumental Errors
 - B-Operative Errors
 - C-Personal Errors
 - D-Methodic Errors (Errors of Method)
- **2-Indeterminate Errors (Random Errors)**

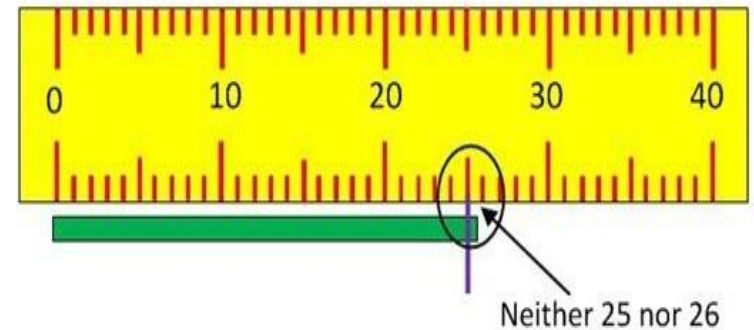
Measurement Error

Systematic Error

Random Error



The length of the rule is not exactly 20



15,000+ Views

Classes of Errors

- **1-Determinate Errors (Systematic Errors)**

Are these errors that are **known** and **controllable** errors (are **known, avoided and corrected**).

Determinate errors are those whose magnitude can be determined (at least in principle) and the measurements thereby corrected. **The analyst can measure and account for these errors.**

For General Classes may be distinguished

- **A- Instrumental Errors:** Those due to apparatus and reagents

1-Balance and Weight;

uncalibrated weight



2- Volumetric apparatus: Use of uncalibrated

glassware.

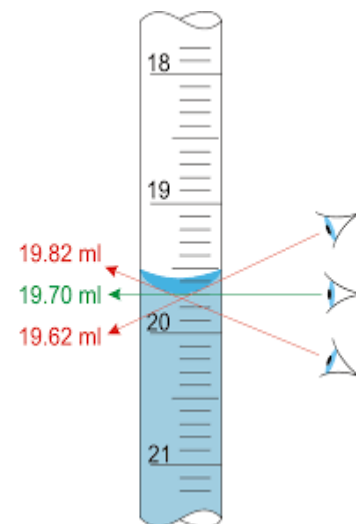


Table 4.2 Measurement Errors for Type A Volumetric Glassware[†]

Transfer Pipets		Volumetric Flasks		Burets	
Capacity (mL)	Tolerance (mL)	Capacity (mL)	Tolerance (mL)	Capacity (mL)	Tolerance (mL)
1	±0.006	5	±0.02	10	±0.02
2	±0.006	10	±0.02	25	±0.03
5	±0.01	25	±0.03	50	±0.05
10	±0.02	50	±0.05		
20	±0.03	100	±0.08		
25	±0.03	250	±0.12		
50	±0.05	500	±0.20		
100	±0.08	1000	±0.30		
		2000	±0.50		

†

For General Classes may be distinguished

- **A- Instrumental Errors:** Those due to apparatus and reagents

3-Vessels and utensils; loss in weight of platinum crucibles when strongly heated.



4- Reagents; Presence of impurities or interfering substances.

For General Classes may be distinguished

- **B- Operative Errors:**

These errors are **mostly physical in nature** and are associated with the manipulations of an analysis, and their **magnitude depends more upon** the **analyst** himself than on any other factor.

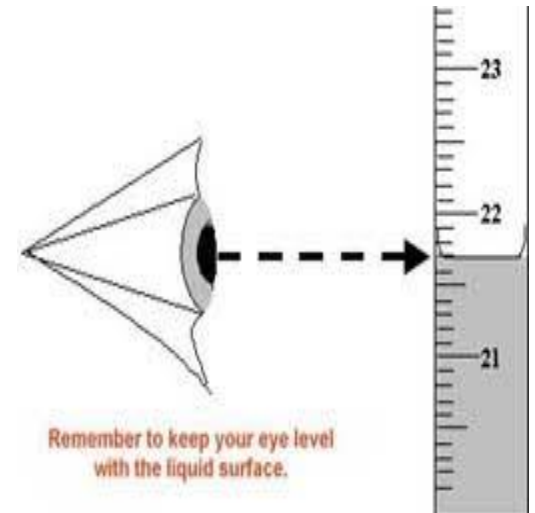
These errors are **reduced** to in significance by **careful, skillful,** and **understanding work.**

For General Classes may be distinguished

- **C- Personal Errors:**

1- Some **persons** are unable to **judge color** changes exactly.

2- Taken in **reading a scale**, burette reading.



For General Classes may be distinguished

- **D- Errors of Methods: Methodic Errors**

Some sources of methodic errors are these:

1- Solubility of a precipitate in the solution in which it is precipitated, and in the wash liquid.

2- Failure of a reaction to proceed to quantitative competition.

3-Precipitation of another substance with the reagent used.

For General Classes may be distinguished

- **D- Errors of Methods: Methodic Errors**

Some sources of methodic errors are these:

4- Coprecipitation and Post Precipitation.

5- Decomposition or volatilization of a precipitate on heating.

6- Induced reaction and side reactions.

2-Indeterminate Errors: (Random Statistical)

- It is generally stated that random errors are **beyond the power of the observer to prevent or allow for**, but this statement refers to **unchanging conditions and methods of measurement**. By working **under same conditions and by taking certain precautions**.

Homework



- *Define The following terms:*

1-Salt

2-Precipitant Agent

3-Decomposition reaction

4-Coprecipitation

5-Post precipitation

6-Solubility

Quiz



- **Question**

Write the **chemical formula** for the following chemicals and then calculate their **molecular weights**?

- 1-Water
- 2-Sodium chloride
- 3-Hydrochloric acid
- 4-Barium chloride
- 5-Carbon dioxide

- At. Wt.:

H:1, **O**:16, **Ba**:137.32, **Cl**:35.45,
Na:23, **C**: 12