كلية الصيدلة
College of Pharmacy
University of Basrah

2nd year
Lab of Physical Pharmacy
Course #:
Lab1: introduction

UOBCOP

Department of Pharmaceutics

Assistant lect. Malathe Alshawi

-BSc. Pharm (Uni. of Basra College of Pharmacy);

-MSc. IPSci. (Brighton University, School of Pharmacy and Biomedical Sciences; UK)

-**Email:** malathe.oda@uobasrah.edu.iq

Objectives

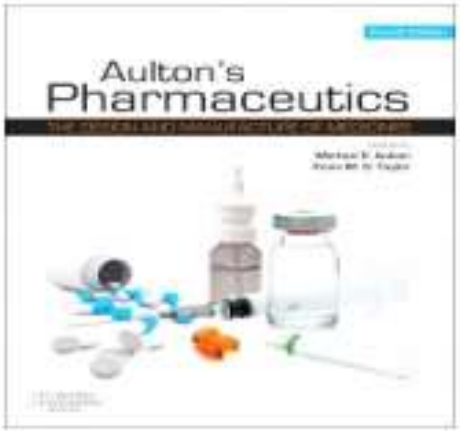
- Introduction.
- Lab assessment sachem.
- Writing your Report and how it will be graded.
- Review of solubility terms.

Introduction:

- Physical pharmacy is the branch of pharmacy that concentrates on the application of physics and chemistry to the study of pharmacy. In other words, it is the study of the effects dosage forms have on their environment by addressing issues at the molecular level.

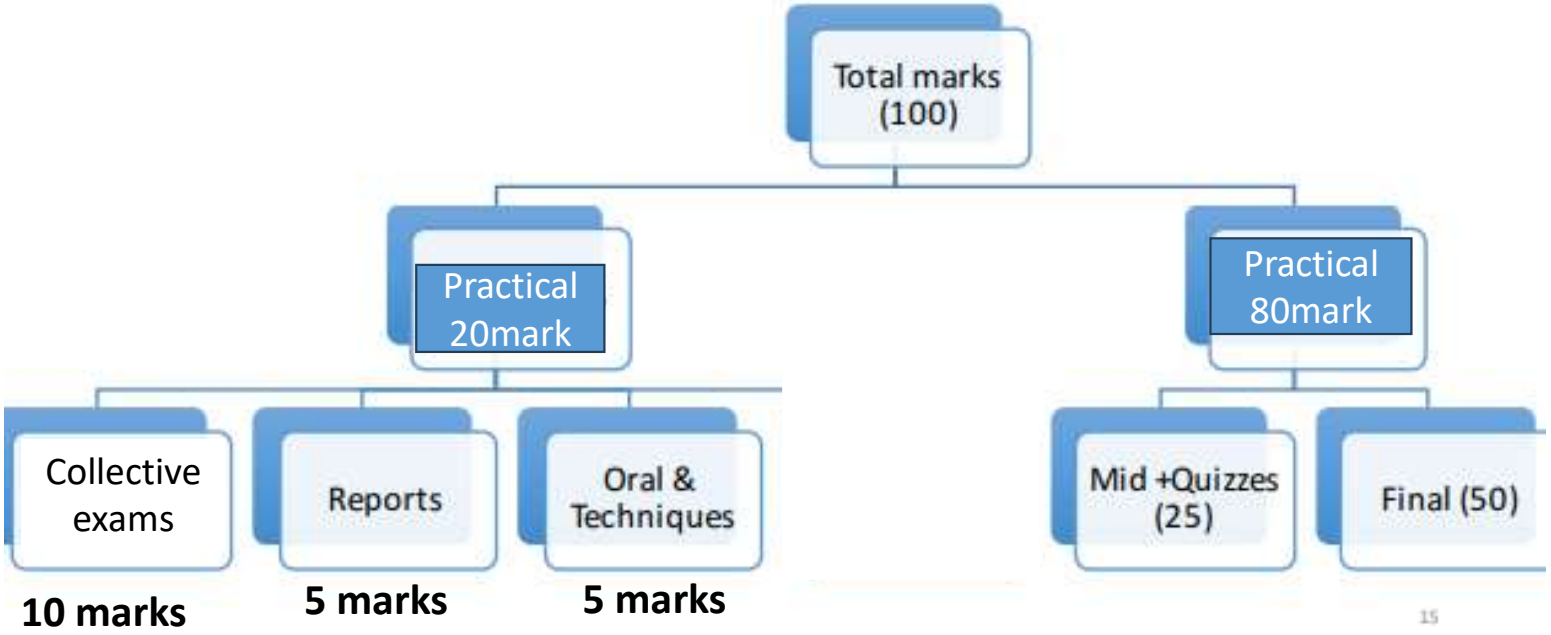
References

Sinko, Patrick J., Loyd V. Allen Jr, Nicolas G. Popovich, and Howard C. Ansel, ***Martin's Physical Pharmacy and Pharmaceutical Sciences,*** (2006).



Aulton, Michael E., and Kevin MG Taylor. ***Aulton's pharmaceutics: the design and manufacture of medicines***. Elsevier Health Sciences, (2013).

Attwood, David, and Alexander Taylor Florence. ***Physicochemical principles of pharmacy***, (2006).


Total marks (100)
Practical 20mark
Practical 80mark
Collective exams
Reports
Oral & Techniques
Mid +Quizzes (25)
Final (50)
10 marks
5 marks
5 marks

Report grading

- ❑Face page: contains:…… (1 mark)
  - Names of contributors (students). Specify the contribution of each one of students.
  - Name of experiment.
  - Date of experiment.
- ❑Introduction :…;……(1 marks)
  - Write a short introduction about the topic of the experiment.
- ❑the aim of experiment …… (2 marks)
- ❑ materials and method were …… (2 marks).
- ❑Results and discussion: …… (2 marks)
  - report your results and discuss these results.
- ❑Conclusion or summary of your work…….. (1marks)
- ❑References …… (1 marks)

Review and definitions:

- Concentration: is a quantity of solute in a definite volume of solution, or quantity of solute in a definite mass of solvent or solution.

- Molarity: M,
- Normality: N,
- Molality: m,
- Mole fraction: x,
- Mole percent x%,
- Percentage w/w%; w/v%; v/v%,

1-Molarity: number of moles of solute in 1 liter of solution.

$$\text{No. of moles} = \frac{\text{wt. of solute}}{\text{m. wt. of solute}}$$

$$M = \frac{\text{no. of moles / liter}}{\text{volume of solution}}$$

$$M = \frac{\text{wt.}}{\text{m. wt.}} * \frac{1000}{V_{ml}} \quad \text{.....(1)}$$

2-Normality: number of equivalents of solute in 1 liter of solution.

$$\text{No. of equivalents} = \frac{\text{wt. of solute}}{\text{eq. wt. of solute}}$$

$$N = \frac{\text{no. of eq. / liter}}{\text{volume of solution}}$$

$$N = \frac{\text{wt.}}{\text{eq. wt.}} * \frac{1000}{V_{ml}} \quad \ldots\ldots\ldots\ldots (2)$$

$$\text{Hint/ eq. wt.} = \frac{\Sigma \text{ atomic weights}}{n}$$

$$N = n * M$$

3-Molality: number of moles in 1000g of solvent.

$$M = \frac{\text{no. of moles}}{\text{1000g of solvent}} \quad \ldots\ldots\ldots (3)$$

4-Mole fraction: the ratio of moles of solute to the moles of solution (summation of solute and solvent).

$$x_1 = \frac{n_1}{n_1 + n_2} \quad \ldots. (4) \qquad \text{Mole fraction of solute}$$

$$x_2 = \frac{n_2}{n_1 + n_2} \quad \ldots.(5) \qquad \text{Mole fraction of solvent}$$

n_1 & n_2 are moles of solute and solvent respectively.

5-Mole fraction percent:

$$x_1\% = \frac{n_1}{n_1 + n_2} * 100 \ldots.(6)$$ Mole fraction percent of solute

6-Percentage:

a: w/v%: weight of solute in 100ml of solution.
b: v/v%: volume of solvent in 100ml of solution.
c: w/w%: weight of solute in 100g of mixture.

$$w/v\% = \frac{\text{wt.}}{\text{Volume of solvent}} * 100 \ldots\ldots. (7)$$

$$v/v\% = \frac{\text{Volume}}{\text{Total volume}} * 100 \ldots\ldots. (8)$$

$$w/w\% = \frac{\text{wt.}}{\text{Total weight}} * 100 \ldots\ldots.. (9)$$

7-Dilution law:

$c_1 * v_1 = c_2 * v_2$ ..... (10)

Example: From 2% of NaCl prepare 100 ml of 0.2%.

$0.2 * 100 = 2 * v_2$

$$v_2 = \frac{0.2 * 100}{2} = 10ml$$

we must take 10ml of 2% solution and complete the volume to 100ml.

Example: Prepare 500ml of (0.15N) of NaOH from stock solution 1N.

$0.15 * 500 = 1 * v_2$

$$v_2 = \frac{0.15 * 500}{1} = 75ml$$

we must take 75ml of 1N solution and complete the volume to 500ml.

List 3 terms to express solubility (10marks)

END