

Experiment 4

Ultraviolet-Visible Spectroscopy – effect of solvent

Section number: _____

Group number: _____

Objective:

Method:

➤ **Part 1: effect of solvent polarity**

- Acetone structure:



- In this part of the experiment the polar solvent we used is ----- while the organic (non-polar) solvent used is -----
- **Calculate the following and show your detailed calculation:**
 - a. The concentration in (% v/v) of acetone standard solution 1 is -----
 - b. The concentration in (% v/v) of acetone standard solution 2 is -----
- Scanning wavelength range -----

➤ Part 2: effect of solvent pH

- Paracetamol structure:



- In this part we used either -----, ----- or ----- as a solvent.
- The concentration of paracetamol stock solution is -----
- **Calculate the following and show your detailed calculation:**
- a. The concentration in (mg/ml) of paracetamol standard solution 1 is -----
- b. The concentration in (mg/ml) of paracetamol standard solution 2 is -----
- Scanning wavelength range -----

Results:

From each peak's table obtained from your analysis using the UV-Vis spectrophotometer instrument, fill the following table with the required data:

		No.	Sample	$\lambda_{\max}$	Absorbance
Part 1	Effect of solvent polarity	1	Acetone in distilled water		
		2	Acetone in organic solvent		

Part 2	Effect of solvent pH	1	Paracetamol in distilled water		
		2	Paracetamol in 0.1 M HCl		
		3	Paracetamol in 0.1 M NaOH		

Discussion

1. What is the type of λ and intensity shifts resulted upon using water as a solvent in comparison to organic solvent in acetone sample?
2. Explain in words any obtained differences in the spectrum between two solvents (water and organic solvent)
3. What is the type of λ and intensity shifts resulted upon using NaOH as a solvent in comparison to water and HCl with paracetamol sample?

4. Explain in words, electron transition and chemical equations any obtained differences in the spectrum between two solvents (water and 0.1 M NaOH)
5. Explain the similarity of the spectrum between water and HCl in paracetamol sample

Experiment Report Workload Distribution Table

Coordinator for Current Experiment ¹ :		
Section ²	Student Name ³	Percentage of the Performed workload ⁴

¹Mention the name of the student/ group member who did arrange the work related to the current experiment group report/work management.

²Section or part of the group report

³Mention the name of student/the group member who took responsibility of the specified group report section

⁴Relative to the whole workload used to prepare the current group report.