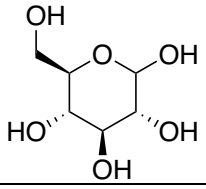
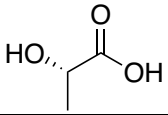
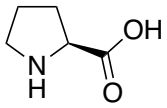
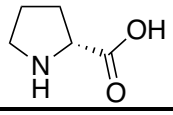
Lab 1: Optical Rotation and Its Determination

Formula Sheet
$$[\alpha]_{\mathrm{D}}^{20} = \frac{\alpha}{cl}$$
$$\%\ ee = \frac{\lvert\alpha_{\mathrm{obs}}\rvert}{\lvert\alpha_{\mathrm{abs}}\rvert} \times 100\%$$

Information of Experiment Reagents			
Name	**IUPAC Name**	**Structure**	**Specific Rotation**
D-glucose	(3R,4S,5S,6R)-6-(hydroxymethyl)oxane-2,3,4,5-tetrol		+52.5°
L-lactic acid	(2S)-2-hydroxypropanoic acid		-13.5°
L-proline	(2S)-pyrrolidine-2-carboxylic acid		
D-proline	(2R)-pyrrolidine-2-carboxylic acid		

Experiment 1: determine the rotation degree of a D-glucose solution and its concentration.

Clearly indicate your raw data, calculation procedure, and give a correct result.

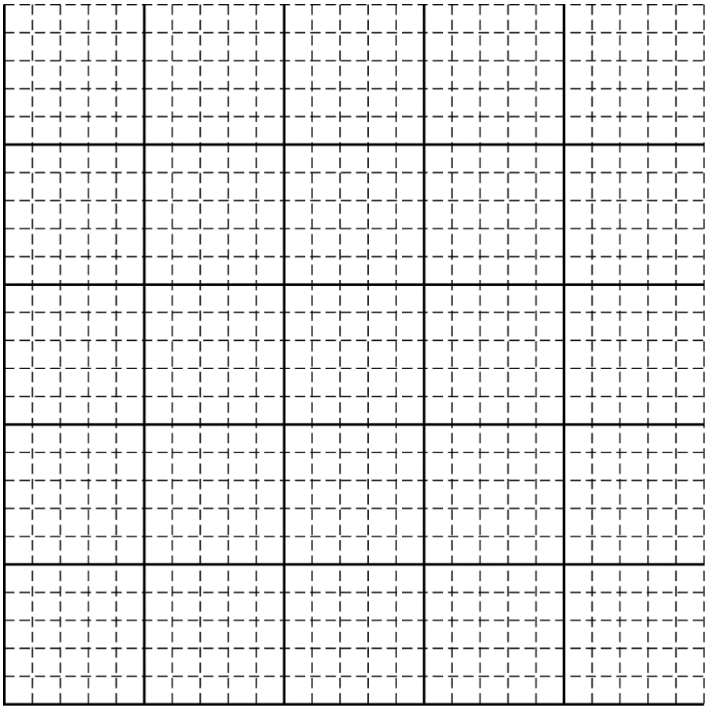
Experiment 2: determine the rotation degree of a L-lactic acid solution and its concentration.

Clearly indicate your raw data, calculation procedure, and give a correct result.

Experiment 3: calculate the <u>specific rotation</u> of L-proline by preparing six sample solutions.

α						
c						

Plot the data points for the quantities from your measurement on the graph below. Clearly scale and label all axes, including units if appropriate. Draw a straight line that best represents the data.



Use your graph to calculate the specific rotation.

Experiment 4: use the specific rotation of L-proline to determine the % *ee* of the levorotatory compound in the pair of enantiomers, and calculate the concentration of each compounds.

Experiment 5: use more than one reagents, prepare a solution that has a rotation degree of +20°.

Reagent	Mass	Volume of Solvent	Concentration

Procedure: