# Optical Activity of Sugar

Will Mallah and Matthew Vanden Berk Physics Department, Saint Vincent College

(Dated: February 19, 2024)

I. INTRODUCTION

II. METHODS

# III. DATA AND RESULTS

Polarization (degrees)	Intensity (arb. units)	Intensity Error (arb. units)
90	0.00	0.10
80	0.14	0.10
70	0.47	0.10
60	1.00	0.30
50	1.65	0.30
40	2.40	0.30
30	3.00	1.00
20	3.40	1.00
10	3.60	1.00
0	3.80	1.00

TABLE I	Nο	hookor	with	no	motor
LABLEL	INO	peaker	with	no	water

Polarization (degrees)	Intensity (arb. units)	Intensity Error (arb. units)
90	0.00	0.10
80	0.05	0.10
70	0.40	0.10
60	0.78	0.10
50	1.25	0.30
40	1.75	0.30
30	2.20	0.30
20	2.55	0.30
10	2.70	0.30
0	2.85	0.30

TABLE II. Small beaker with no water

Polarization (degrees)	Intensity (arb. units)	Intensity Error (arb. units)
90	0.00	0.10
80	0.12	0.10
70	0.47	0.10
60	0.94	0.10
50	1.50	0.30
40	2.10	0.30
30	2.65	0.30
20	3.00	1.00
10	3.20	1.00
0	3.30	1.00

TABLE III. Medium beaker with no water

Polarization (degrees)	Intensity (arb. units)	Intensity Error (arb. units)
90	0.00	0.10
80	0.10	0.10
70	0.37	0.10
60	0.80	0.10
50	1.30	0.30
40	1.80	0.30
30	2.25	0.30
20	2.50	0.30
10	2.80	0.30
0	2.90	0.30

TABLE IV. Large beaker with no water

Polarization (degrees)	Intensity (arb. unit	s) Intensity Error (arb. units)
90	0.88	0.10
80	2.65	0.30
70	6.20	1.00
60	12.00	3.00
50	18.00	3.00
40	25.50	3.00
30	31.00	10.00
20	35.00	10.00
10	38.00	10.00
0	39.00	10.00

TABLE V. Large beaker with water

# IV. DISCUSSION

Polarization (degrees	s) Intensity (arb. units)	Intensity Error (arb. units)	Polarization (degrees	) Intensity (arb. units)	Intensity Error (arb. units)
90	0.27	0.10	100	0.80	0.30
80	0.88	0.10	90	2.25	0.30
70	2.50	0.30	80	5.00	1.00
60	4.60	1.00	70	8.90	1.00
50	7.40	1.00	60	13.00	3.00
40	10.00	3.00	50	16.50	3.00
30	12.50	3.00	40	21.50	3.00
20	14.50	3.00	30	24.00	3.00
10	15.50	3.00	20	26.00	3.00
0	16.00	3.00	10	25.50	3.00
			0	24.00	3.00

TABLE VI. Medium beaker with water

Polarization (degrees)	Intensity (arb. units)	Intensity Error (arb. units)
90	0.09	0.10
80	0.43	0.10
70	1.30	0.30
60	2.40	0.30
50	3.90	1.00
40	5.20	1.00
30	6.60	1.00
20	7.60	1.00
10	8.20	1.00
0	8.60	1.00

TABLE VII. Large beaker with water

# V. CONCLUSION

TABLE VIII. Small beaker with Solution 1

Polarization (degrees)	Intensity (arb. units)	Intensity Error (arb. units)
90	1.90	0.30
80	3.90	1.00
70	6.20	1.00
60	9.20	1.00
50	11.50	3.00
40	13.50	3.00
30	15.00	3.00
20	15.00	3.00
10	14.50	3.00
0	13.50	3.00

TABLE IX. Medium beaker with Solution 1

#### ACKNOWLEDGMENTS

We wish to acknowledge the support of the author community in using REVT<sub>E</sub>X, offering suggestions and encouragement, testing new versions,  $\dots$ 

# Appendix A: Appendixes

To start the appendixes, use the \appendix command. This signals that all following section commands refer to appendixes instead of regular sections. Therefore, the \appendix command should be used only once—to setup the section commands to act as appendixes. Thereafter normal section commands are used. The heading for a section can be left empty. For example,

\appendix
\section{}

will produce an appendix heading that says "APPENDIX A" and

\appendix \section{Background}

will produce an appendix heading that says "APPENDIX A: BACKGROUND" (note that the colon is set automatically).

If there is only one appendix, then the letter "A" should not appear. This is suppressed by using the star version of the appendix command (\appendix\* in the place of \appendix).

Polarization (degrees)	Intensity (arb. units)	Intensity Error (arb. units)
90	1.30	0.30
80	2.50	0.30
70	4.00	1.00
60	5.40	1.00
50	6.70	1.00
40	7.60	1.00
30	8.30	1.00
20	8.50	1.00
10	8.10	1.00
0	7.20	1.00

TABLE X. Large beaker with Solution 1

Polarization (degrees)	Intensity (arb. units)	Intensity Error (arb. units)
90	9.40	1.00
80	13.50	3.00
70	17.50	3.00
60	21.00	3.00
50	23.00	3.00
40	23.50	3.00
30	24.50	3.00
20	22.00	3.00
10	19.50	3.00
0	15.50	3.00

TABLE XI. Medium beaker with Solution 2

# Appendix B: A little more on appendixes

Observe that this appendix was started by using

\section{A little more on appendixes}

Note the equation number in an appendix:

$$E = mc^2. (B1)$$

# 1. A subsection in an appendix

You can use a subsection or subsubsection in an appendix. Note the numbering: we are now in Appendix B 1.

Note the equation numbers in this appendix, produced with the subequations environment:

$$E = mc,$$
 (B2a)

$$E = mc^2, (B2b)$$

$$E \gtrsim mc^3$$
. (B2c)

They turn out to be Eqs. (B2a), (B2b), and (B2c).

Polarization (degrees)	Intensity (arb. units)	Intensity Error (arb. units)
90	2.20	0.30
80	3.10	1.00
70	4.30	1.00
60	5.20	1.00
50	5.80	1.00
40	5.90	1.00
30	6.40	1.00
20	5.80	1.00
10	5.10	1.00
0	3.70	1.00

TABLE XII. Large beaker with Solution  $2\,$ 

Polarization (degrees)	Intensity (arb. units)	Intensity Error (arb. units)
90	5.00	1.00
80	7.70	1.00
70	11.00	3.00
60	14.00	3.00
50	17.00	3.00
40	18.50	3.00
30	19.00	3.00
20	19.50	3.00
10	17.50	3.00
0	13.50	3.00

TABLE XIII. Small beaker with Solution 2

Polarization (degrees)	Intensity (arb. units)	Intensity Error (arb. units)
90	1.70	0.30
80	5.30	1.00
70	11.00	3.00
60	17.50	3.00
50	26.00	3.00
40	34.00	10.00
30	40.00	10.00
20	44.00	10.00
10	46.00	10.00
0	46.00	10.00

TABLE XIV. Small beaker with Solution 3

Polarization (degrees)	Intensity (arb. units)	Intensity Error (arb. units)
90	0.58	0.10
80	1.75	0.30
70	3.40	1.00
60	5.80	1.00
50	8.40	1.00
40	11.00	3.00
30	12.00	3.00
20	13.00	3.00
10	13.50	3.00
0	13.50	3.00

TABLE XV. Medium beaker with Solution 3

TABLE A	v. Medium beaker	with Solution 5
Polarization (degrees)	Intensity (arb. units)	Intensity Error (arb. units)
90	0.41	0.10
80	1.10	0.30
70	2.25	0.30
60	3.60	1.00
50	5.10	1.00
40	6.40	1.00
30	7.30	1.00
20	8.00	1.00
10	8.20	1.00
0	8.00	1.00

TABLE XVI. Large beaker with Solution 3

Polarization (degrees)	Intensity (arb. units)	Intensity Error (arb. units)
90	1.20	0.30
80	3.80	1.00
70	9.20	1.00
60	16.00	3.00
50	24.50	3.00
40	32.00	10.00
30	38.00	10.00
20	43.00	10.00
10	46.00	10.00
0	46.00	10.00

TABLE XVII. Small beaker with Solution 4

Polarization (degrees)	Intensity (arb. units)	Intensity Error (arb. units)
90	0.29	0.10
80	1.05	0.30
70	2.55	1.00
60	4.50	1.00
50	6.60	1.00
40	9.20	3.00
30	11.00	3.00
20	12.00	3.00
10	13.00	3.00
0	13.00	3.00

TABLE XVIII. Medium beaker with Solution 4