<u>Figure Formatting Checklist</u>

<u>Figures:</u>

In scientific literature and technical documents, a **figure** is a visual tool used to efficiently convey information. A figure is a broad term that encompasses any visual representation such as graphs, tables, images, diagrams, and schemes. Figures can be used to illustrate experimental setups or provide visual summaries of results, helping to make complex information more accessible and easier to understand. Generally, in these laboratory courses, schemes, tables, and graphs are specifically labeled as such; while everything else is labeled as a figure.

A **scheme** is a specific type of figure typically used in chemistry. It outlines a reaction or a sequence of reactions, providing a visual representation of a process or pathway. The formatting guidelines are the same for both a figure and a scheme.

- Caption:
    - It should be below the figure or scheme.
    - "**Figure #.**" or "**Scheme #.**" should be in bold.
    - The part after "**Figure #.**" or "**Scheme #.**" should describe the figure or scheme and should not be in bold.
- Size:
    - It should be no bigger than ½ page.
    - It should be big enough to be read/interpreted easily.
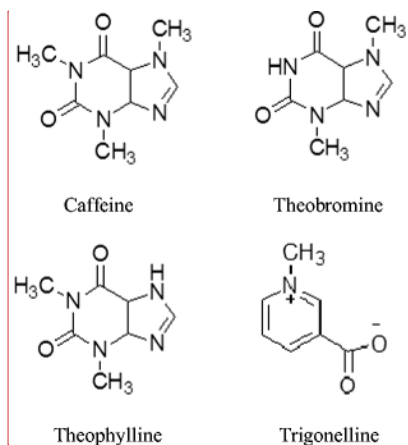
Examples:

Figure 1. Four coffee alkaloids.[1]

Commented [BM1]: figure =/= scheme, we should have separate examples
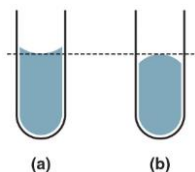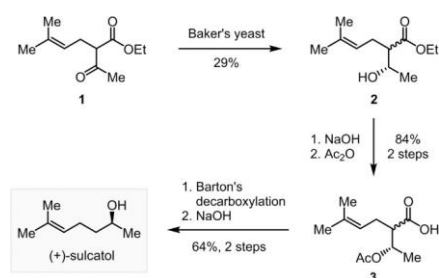
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Figure 2. Illustration of a concave (a) and convex (b) meniscus.[2]

Scheme 1. Maycock's total synthesis of (+)-sulcatol.[3]

Tables:

A table is an organized arrangement of data in rows and columns, used to systematically present data. Tables are particularly useful for displaying numerical data.

- Caption:
  - It should be above the table.
  - "**Table #.**" should be in bold.
  - The part after "**Table #.**" should describe this table and should not be in bold.
- Column/Row Header:
  - It should be differentiated in some fashion.
    - It can be bolded and/or have shading.
  - When applicable, each header should be labeled with correct units.
- Border:
  - Borders should be 1 pt black line
  - If headers are organized in the top row, you can remove inner horizontal
  - If headers are organized in the left column, you can remove vertical borders
- Formatting:
  - Each column should be auto-fit in width to remove excess white space
  - Data in the table should be center-aligned
  - The font and font size should be consistent within the table

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Examples:

Table 1. 1st electron affinity for elements B, C, N, O, and F.[4]

Element	Atomic Number	1st Electron Affinity (kJ/mol)
B	5	26.7
C	6	153.9
N	7	7
O	8	141
F	9	328

Table 2. 1st electron affinity for elements B, C, N, O, and F.[4]

Element	Atomic Number	1st Electron Affinity (kJ/mol)
B	5	26.7
C	6	153.9
N	7	7
O	8	141
F	9	328

Table 3. 1st electron affinity for elements B, C, N, O, and F.[4]

Element	B	C	N	O	F
Atomic Number	5	6	7	8	9
1st Electron Affinity (kJ/mol)	26.7	153.9	7	141	328

Table 4. 1st electron affinity for elements B, C, N, O, and F.[4]
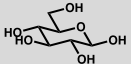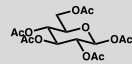
Element	B	C	N	O	F
Atomic Number	5	6	7	8	9
1st Electron Affinity (kJ/mol)	26.7	153.9	7	141	328

Table 5. Reaction table for global acetylation of glucose.

Chemical	MW (g/mol)	mmol	Mass (g)	Vol.	Density	Notes
Glucose	180.16	11.795	2.125			limiting reagent
Acetic anhydride	102.089	117.95	12.0415	11.1 mL	1.082 g/mL	10 eq.
Pyridine	79.102	176.93	13.995	14.3 mL	0.9819 g/mL	15 eq.
$C_{16}H_{22}O_{11}$	390.34		3.867			actual yield

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Table 6. Reaction table for global acetylation of glucose.

| Chemical				→	
MW (g/mol)	180.16	102.089	79.102		390.34
mmol	11.795	117.95	176.93		
Mass (g)	2.125	12.0415	13.995		3.867
Vol.		11.1 mL	14.3 mL		
Density		1.082 g/mL	0.9819 g/mL		
Notes	limiting reagent	10 eq	15 eq		actual yield

Graphs/Plots:

- Caption:
  - It should be below the graph.
  - "**Graph #.**" should be in bold.
  - The part after "**Graph #.**" should describe this graph and should not be in bold.
- Title and axis titles:
  - The graph should have a title describing what is being plotted
  - The axes should have titles.
- Trendline and equations/R^2 values:
  - When appropriate, graph should include an appropriate best-fit line
  - Best-fit line equation and R^2 value should be displayed next to the line and not overlap with data
  - If there are more than one data set plotted in one graph, students should include the legend with different colors and/or symbol shapes to distinguish each data set
  - Trendline should be applied to appropriate data (see Graph 3)
- Formatting:
  - The *x*-axis/*y*-axis range should be adjusted to minimize the excess white space on the plot
  - The size and type of font should be consistent within the graph
  - The inner vertical and horizonal gridlines can be included
- Size:
  - It should be no bigger than ½ page
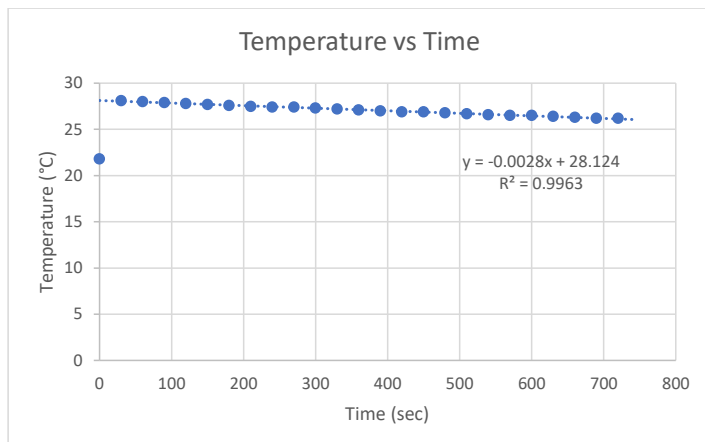
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Examples:
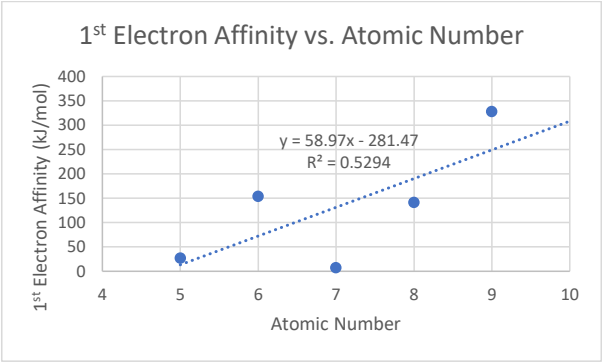
Graph 1. 1st electron affinity for elements B to F.[4]
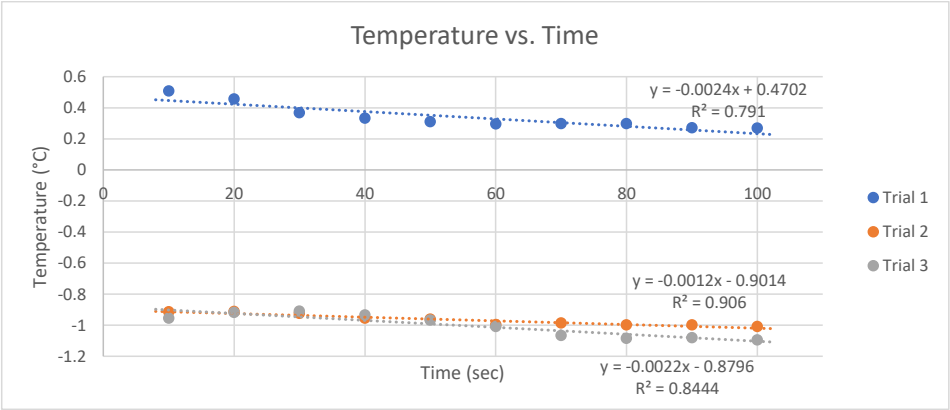
Graph 2. Temperature vs. Time for three trials (color-code trendline equations).

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Temperature vs Time

Graph 3. Temperature vs. Time for Coffee Cup Calorimetry (trendline ignores first data point).

Citations/References:

Superscript citations are a method of referencing sources in written text.

- Superscript numbers are placed immediately after the information or quotation that requires a citation.
- The citations are numbered sequentially in the order they appear in the text.
- The references should be placed at the end of the document.
  - Start with the superscript #
  - Any citation style can be used as long as it gives enough information to unambiguously lead to the source.

References:

1. Mehari, Bewketu & Redi, Mesfin & Chandravanshi, B. & Atlabachew, Minaleshewa & Combrinck, Sandra & Mccrindle, Robert. Simultaneous Determination of Alkaloids in Green Coffee Beans from Ethiopia: Chemometric Evaluation of Geographical Origin. *Food Analytical Methods* **2016**, *9*, 1627-1637.
2. Lee, Ed. *Chemistry 119 Laboratory Manual – Texas A&M University* **2024**, 10.
3. Afonso C.M., Barros M.T., Godinho L., Maycock C.D. *Tetrahedron Lett.* **1989,** *30*, 2707-2708.
4. Dynamic Periodic Table. www.ptable.com (Accessed September 12, 2019).