Quick & Dirty Guide to Preparing Effective Figures

CHEG 4137W
Chemical Engineering Laboratory
A Graph Excel Will Make

THIS IS UNACCEPTABLE
What’s Wrong With This Graph?
What Else is Missing?
A Functional Figure

- Water Flux (L/m² hr)
- Transmembrane Pressure (psi)

Symbols:
- BW30
- NF90
- NF270
Aesthetically Optimized Graph

Figure 1: Water flux at increasing transmembrane pressure for two nanofiltration and one reverse osmosis membrane. Error bars indicate one standard deviation based on three data points.
Data vs. Predictions
Distinguish Data & Predictions
Make Your Points Visible
Point Shape vs. Color

Outlet Flow Rate (L/min) vs. Pump Head (bar) for different RPM settings: 1500 RPM, 2000 RPM, 2500 RPM, and 3000 RPM.
Consider Your Graphs Without Color
Use Visible Colors

(Hint: Don’t use any of these)
Effective Use of Shapes & Color
Figure 4: Height of water (a) or 50% weight glycerol solution (b) in a cylindrical tank with pipes of various diameter attached to the bottom. Points indicate the average of three measurements, and lines indicate predicted height based on a model.
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Summary

• Points & Colors
  – Make points large enough to see
  – Use color & shape *intelligently* to distinguish data sets
  – Experimental data are *only points*
  – Predictions based on models/theory are *only lines*
  – Sometimes it’s better to vary pattern or shape instead of color
  – Always remember your error bars
Summary

• Axes and Lables
  – Label all axes with descriptive titles and units
  – Make graph axes legible
  – Control your significant figures
  – When comparing multiple graphs, keep all x- and y-axis ranges the same for each graph

• Aesthetics
  – Avoid gridlines
  – Graph area should be enclosed, not entire figure