

LabQuest 11

the regression line passes through or near the origin. The correlation coefficient, r , indicates how closely the data points match up with (or *fit*) the regression line. A value of 1.00 indicates a nearly perfect fit.

- e. Select OK. The graph should indicate a direct relationship between absorbance and concentration, a relationship known as Beer's law. The regression line should closely fit the five data points *and* pass through (or near) the origin of the graph.
10. Determine the absorbance value of the unknown NiSO₄ solution.
 - a. Tap the Meter tab.
 - b. Obtain about 5 mL of the *unknown* NiSO₄ in another clean, dry, test tube. Record the number of the unknown in your data table.
 - c. Rinse the cuvette twice with the unknown solution and fill it about 3/4 full. Wipe the outside of the cuvette and place it into the device.
 - d. Monitor the absorbance value. When this value has stabilized, record it in your data table.
 11. Discard the solutions as directed by your instructor. Proceed to Step 1 of Processing the Data.

PROCESSING THE DATA

1. To determine the concentration of the unknown NiSO₄ solution, interpolate along the regression line to convert the absorbance value of the unknown to concentration.
 - a. Tap the Graph tab.
 - b. Choose Interpolate from the Analyze menu.
 - c. Tap any point on the regression curve (or use the ◀ or ▶ keys on LabQuest) to find the absorbance value that is closest to the absorbance reading you obtained in Step 10. The corresponding NiSO₄ concentration, in mol/L, will be displayed to the right of the graph.
 - d. Record the concentration value in your data table.
2. (optional) Print a graph of absorbance vs. concentration, with a regression line and interpolated unknown concentration displayed.

DATA AND CALCULATIONS

Trial	Concentration (mol/L)	Absorbance
1	0.080	0.087
2	0.16	0.0211
3	0.24	0.314
4	0.32	0.464
5	0.40	0.644
6	Unknown number ____	0.205
Concentration of unknown		727.6 mol/L

Full solution