

Bond Strength of Nitric Oxide

Name: _____ Date: _____

Partner: _____

Use *complete sentences*, use the proper number of significant figures, and include units.

Introduction (2-sentence maximum):

Procedure: (Give one-sentence descriptions of the synthesis and the gas collection method. Reference the lab write-up and list any changes. Give the IR cell path length, cell window material, and the manufacturer and model of the IR spectrophotometer.)

Results: Give your results for the vibrational wavenumber, the frequency, the energy in kJ/mol of photons absorbed, reduced mass, and the force constant of the NO bond as a table.

Discussion: (a). Purpose accomplished:

(b). Write a balanced reaction for the synthesis of NO. (Give an intro sentence: "The balanced reaction used to produce nitric oxide is..")

(c). Using the experimental NO force constant and Figure 4, predict the bond order for NO. Make sure to give an explicit reference to Figure 4 in your text.

(d). *Predict the qualitative bond order for NO based on molecular orbital theory. Show your MO diagram and electron filling. Report the qualitative bond order. (Use complete sentences to give your results. Label the MO diagram as a Figure. Give a Figure caption.)*

(e). *Predict the bond order for NO using a Lewis dot structure.*

(f). *Do the bond orders determined in parts (c), (d), and (e) agree? Provide the context for your decision.*

(g). *Does this experiment provide experimental validation of molecular orbital theory? why?*

Literature Cited: Give all literature cited, numbered according to the references in the body of your report. (You may not have any literature cited for this report other than a reference to the lab write-up and the On-line URL. Don't forget the last accessed date. See experiment 1 for the format of the reference to the on-line lab manual.)

Attach a copy of both infrared spectra. Identify the NO peak and two other peaks.

Checklist:

Use complete sentences and provide the proper number of significant figures and units.

All Figures and Tables must have captions.

Refer by number to each figure and table in the body of the text or your report.

Acknowledge any data that were not taken by you and your partner (if you had a partner).

Captions start with Figure # or Table # and then a concise description of the contents.

You can write the captions by hand in black pen on attached sheets.

Answer all the questions in the Discussion section of the write-up.

Remove all the italicized prompts in your final report. The report should then read smoothly.