

EXPERIMENT 4: FORMATION AND DIMERIZATION OF NO₂**LAB REPORT WORKSHEET***Notebook Pages*

Copy and attach those pages of your notebook that show the raw data and one complete set of calculations for the experiment.

Calculations

1. This will take you through one set of calculations for **Addition #1** (3 mL of added O₂). Where a calculation, even a simple one, is performed, show your work explicitly. Fill in the table (opposite side of this sheet) accordingly, and repeat for remaining trials.

Total syringe volume =
Excess volume of NO =
Excess volume of O ₂ =
Volume of NO ₂ expected =
Actual volume of NO ₂ =
Actual volume of N ₂ O ₄ =
P _{NO₂} =
P _{N₂O₄} =
K _p =

2. Based on the results of your calculations, complete the following table. Note that you should calculate the average K_p value and the standard deviation. *Be sure to include a caption for the table.*

Table 1.

Addition #	Volume (mL)							Pressure (atm)		K_p
	O ₂ added	Total syringe	Excess V(NO)	Excess V(O ₂)	V(NO ₂) expected	V(NO ₂)	V(N ₂ O ₄)	P _{NO₂}	P _{N₂O₄}	
0	0	20.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	-
1										
2										
3										
4										
5										
6										
7										
8										
Average										
Standard deviation										

3. How does the total syringe volume change upon the first few additions of O₂ as compared to the change over the last additions? Briefly explain.

4. Calculate a value for K_p from ΔG_f° values (from the back of the text) a compare it to your experimentally derived value. Are your results in agreement with the expected value? Is there a clear source of systematic error if they are not in agreement?