# Report Sheet: Spectroscopy

CAPILANO UNIVERSITY

Department of Chemistry

LAST NAME: _____ SEC # _____ LOCKER # _____

FIRST NAME: _____ DATE: _____

**Record all data in ink (blue or black only) at the appropriate location on this report sheet. All entries must be original and legible, and all corrections must be made in the acceptable way, with your lab supervisor's initials. Do not drop "leading zeroes". Show all calculations clearly and neatly.**

**Name of Partner**: **NA** **MeasureNet® workstation #: NA**

## RAW DATA

### Part 1 Analyte Preparation

*Who performed this part?* I did ☑ My partner did ☐

Steel Sample Number: **NA**

Mass of Steel Sample: _____ g

Volume of Analyte Solution: _____mL

### Part 2 Preparation of Standard Solutions

*Who performed this part?* I did ☑ My partner did ☐

Concentration of stock solution: _____ mol / L

Volume of stock solution pipetted for intermediate: _____ mL

Volume of intermediate solution: _____ mL

| | Standard 1 | Standard 2 | Standard 3 |
|---|---|---|---|
| Initial burette reading: | mL | mL | mL |
| Final burette reading: | mL | mL | mL |
| Volume of intermediate delivered from burette: | mL | mL | mL |
| Total volume of *diluted* solution: | mL | mL | mL |

## CALCULATIONS – Concentrations of Standard Solutions

Calculate the concentration of the intermediate solution:

*(Report in **scientific notation** and **don't round off**)*

_____ mol/L

Calculate the concentrations of the three standards:

(*Show sample calculation **only** for **Standard 1.** Give results in **scientific notation** and **properly rounded off** considering the concentration of the stock $KMnO_4$ solution)*

**Standard 1** **Standard 2** **Standard 3**

_____ mol/L _____ mol/L _____ mol/L

## INFORMATION OBTAINED FROM THE ABSORPTION SPECTRA PRINTOUT

| Solution: | Standard 1 | Standard 2 | Standard 3 | Analyte |
|---|---|---|---|---|
| **Absorbance @ $\lambda_{max}$** | | | | |
| | | **$\lambda_{max}$ =** | nm | |

## CALCULATIONS – Required for the Analyte Solution

- **TO BE COMPLETED AFTER USING THE EXCEL WORKBOOK.**
- **GIVE ALL ANSWERS ON THIS PAGE IN <u>SCIENTIFIC NOTATION</u>.**

*From the Calibration Graph:*
Equation of best-fit line through origin:_____

From the above equation, determine the **slope** of the line:

_____ L / mol

Calculate the **molar absorptivity**, $\varepsilon$, for $MnO_4^-$:

_____ L / mol·cm

Calculate the **concentration** of the analyte:
*Do not round off this intermediate result when using in the next calculation for % Mn.*

_____ mol/L

Calculate the **percent manganese** in the steel sample:
*Report the final answer to the correct number of significant figures.*

_____ %

***Continued on back.***

## QUESTION

Refer to *"Significance of this Experiment"* in the Introduction section of the lab manual for Experiment #3. Review the discussion on steel alloys and railroad tracks.

**1.** Based on your results, is the unknown steel suitable for the manufacture of railroad tracks?

**YES** ☐ **NO** ☐

**2.** Explain why:

_____

_____

_____

_____

**Staple your entire report together in this order:**

- **Report Sheet**
- **Absorption Spectra Printout**
- **Standard Calibration Graph**