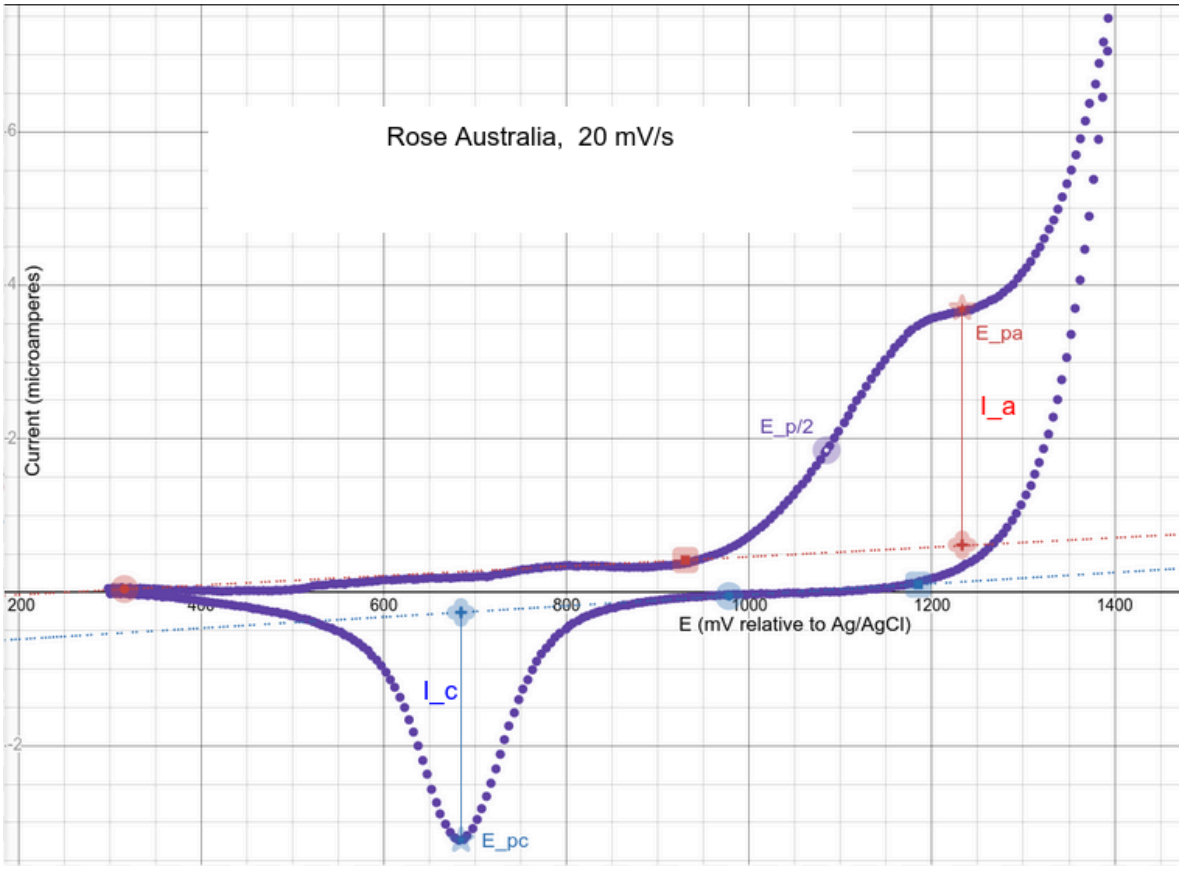
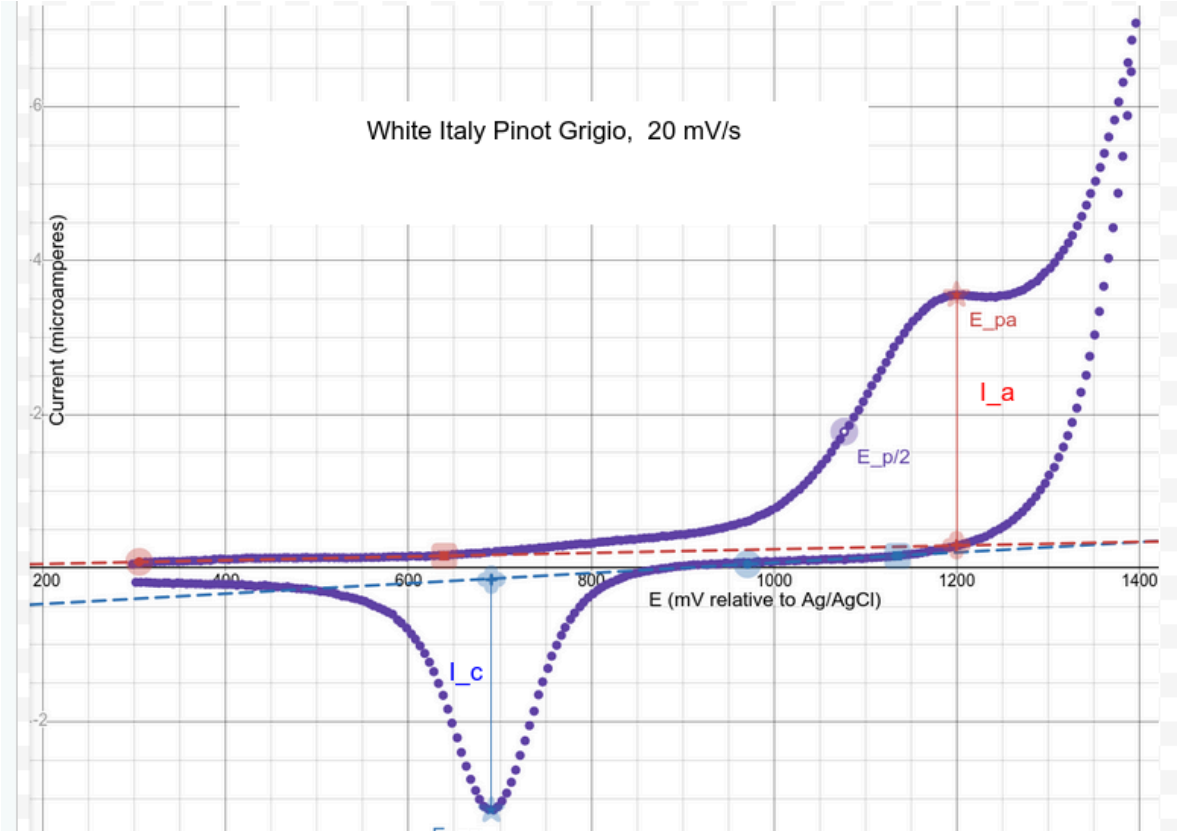
Lab 9: Analysis of Wine Using PCA

Questions

1. https://docs.google.com/spreadsheets/d/11nICFs_IWLvptGVQwJOkuhFIGhMHvmXj-roou_IRF8I/edit?usp=sharing
2. 



3. Voltages given relative to SHE

Wine type and name	Scan Rate (mV/s)	Epa (mV)	Epc (mV)	Ep/2 (mV)	Emid (mV)	(Epa+Ep/2)/2 (mV)	Epa-Ep/2	Ipa (A)	Ipc (A)	Ipc/Ipa (A)
White Italy Pinot Grigio B	20	1419.7	910.5	1297	1165.1	1358.35	122.7	3.25E-06	-3.00E-06	-0.92
Rose Australia	20	1453	913	1308	1183	1380.5	145	3.12E-06	-2.96E-06	-0.95
Unknown	20	1421.6	927	1313	1174.3	1367.3	108.6	-3.06E-06	-3.06E-06	1.00

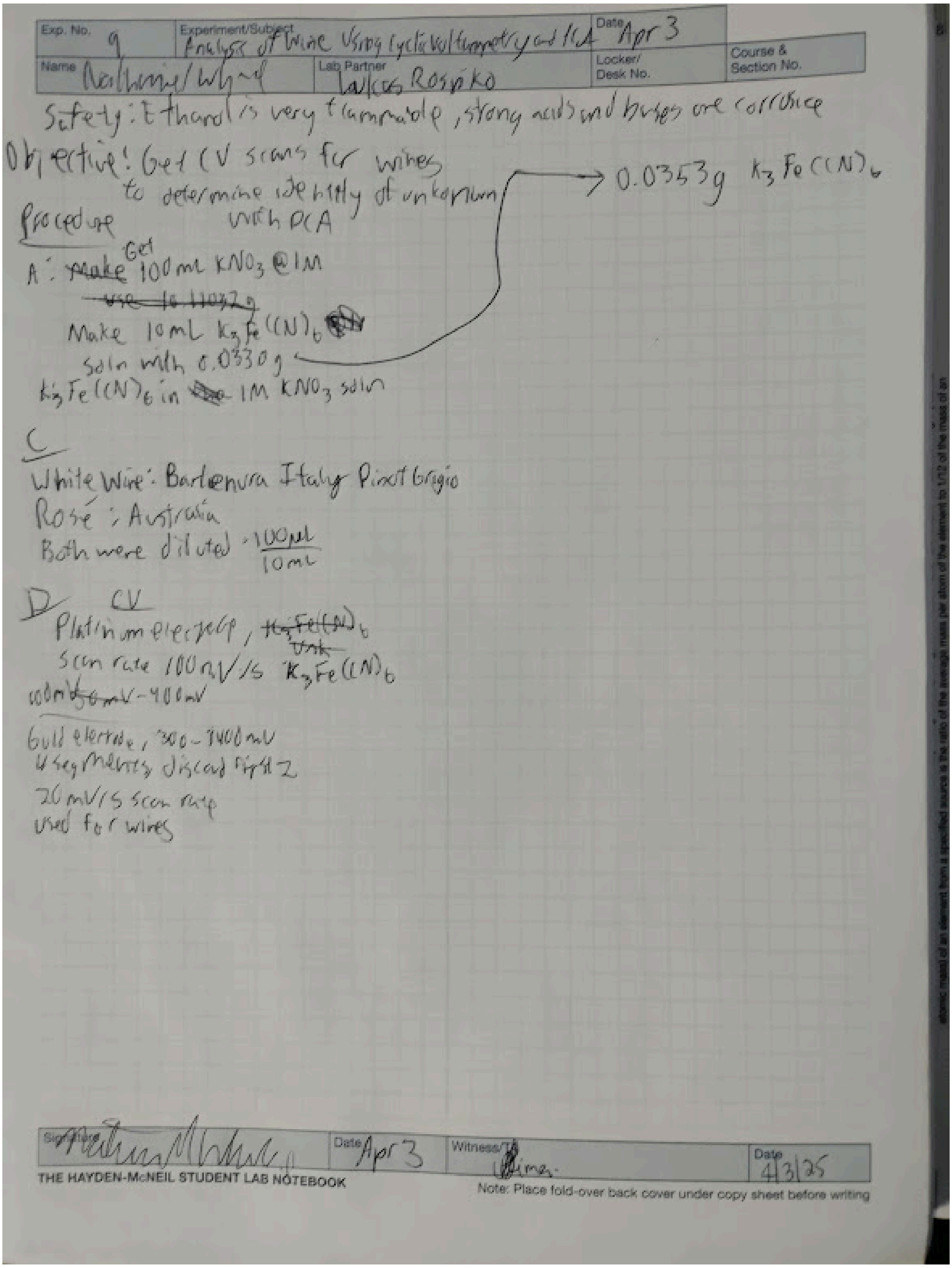
4. Given that we only have three data points for each category, there is insufficient power to determine based on our samples alone which characteristics are the same or different between the wine samples. All observed and computed values are relatively similar to roughly the same extent. The unknown wine is closer to the white wine for cathodic measurements and closer to the Rose for anodic measurements.

The potential for ferricyanide vs Ag/AgCl can be computed from literature as 360 mV - 220 mV = 140 mV. It was not recorded experimentally during this lab due to explicit instruction by a TA.

Our blank reading showed strong repeated evidence of contamination with observed peaks similar to our voltammograms for the wine sample, thus we did not subtract our blank for our data analysis.

https://docs.google.com/spreadsheets/d/10stXnoedHNH2xuzVSs6tJZiiTX57NDyTO8v6CKn_eck/edit?gid=301451791#gid=301451791

Lab Notebook



Exp. No.	Experiment/Subject	Date
9	Analysis of Wine Using Cyclic Voltammetry and PCA	Apr 3

Name	Lab Partner	Locker/ Desk No.	Course & Section No.
[illegible]	[illegible] Rospko		

Safety: Ethanol is very flammable, strong acids and bases are corrosive

Objective: Get CV scans for wines to determine identity of unknown with PCA → $0.0353g$ $K_3Fe(CN)_6$

Procedure

A: ~~Make~~ Get 100 mL KNO_3 @ 1M

~~use [illegible]~~

Make 10 mL $K_3Fe(CN)_6$ soln with 0.0330 g $K_3Fe(CN)_6$ in 1M KNO_3 soln

C

White Wine: Bardenura Italy Pinot Grigio

Rosé: Australia

Both were diluted $\frac{100\mu L}{10mL}$

D CV

Platinum electrode, ~~$K_3Fe(CN)_6$~~ Unk

scan rate 100 mV/s $K_3Fe(CN)_6$

100mV ~~[illegible]~~ - 400 mV

Gold electrode, 300 - 1400 mV

4 segments discard first 2

20 mV/s scan rate

used for wines

Signature	Date	Witness/TA	Date
[illegible]	Apr 3	[illegible]	4/3/25

THE HAYDEN-McNEIL STUDENT LAB NOTEBOOK

Note: Place fold-over back cover under copy sheet before writing