analysis

May 13, 2023

1 Modules

[ ]:
```
import pandas as pd
```

2 Data

[ ]:
```
KMNO4 = pd.read_csv("KMNO4.txt")
sodium_oxalate = pd.read_csv("sodium-oxalate.txt")
```

[ ]:
```
KMNO4
```

[ ]:

	Na2C2O4(g)	KMNO4-0.1M(mL)
0	0.34	10.1
1	0.33	9.8

[ ]:
```
sodium_oxalate
```

[ ]:

	m(g)	KMNO4(mL)
0	0.34	6.3
1	0.33	6.3

3 Theory reaction of equation in acid medium

$KMnO_4$ with $Na_2C_2O_4$ in a

$2MnO_4^- + 16H^+ + 5C_2O_4^{2-} \leftrightarrow (10CO_2)_g + 2Mn^{2+} + 8H_2O$

[ ]:
```
mols_potassium_permanganate = 0.1 * (10e-3)
mols_sodium_oxalate = mols_potassium_permanganate * (5/2)
mass_sodium_oxalate = mols_sodium_oxalate*134

"We need aproximate "+str(mass_sodium_oxalate) + "g of sodium oxalate"
```

[ ]:
```
'We need aproximate 0.335g of sodium oxalate'
```

4 Concetration of MnO_4

[ ]:
```
mols_potassium_permanganate = (KMNO4["Na2C2O4(g)"] / 134) * (2/5)
M_potassium_permanganate = mols_potassium_permanganate / ( (KMNO4["KMNO4-0.
 ↪1M(mL)"] )*1e-3 )
N_potassium_permanganate = M_potassium_permanganate /5

mean_M_potassium_permanganate = round( M_potassium_permanganate.mean() , 2)
mean_N_potassium_permanganate = round( N_potassium_permanganate.mean(), 3 )
std_M_potassium_permanganate = round( M_potassium_permanganate.std() , 5)
std_N_potassium_permanganate = round( N_potassium_permanganate.std(), 6 )



"The solution of potassium permangan has a concentration of ( "+str(␣
 ↪mean_M_potassium_permanganate )+" +- "+str(std_M_potassium_permanganate) + "␣
 ↪)M and a normality of ("+str( mean_N_potassium_permanganate ) +" +- " +␣
 ↪str(std_N_potassium_permanganate) + ") N"
```

[ ]:
```
'The solution of potassium permangan has a concentration of ( 0.1 +- 2e-05 )M
and a normality of (0.02 +- 4e-06) N'
```

5 Purity sample of sodium oxalate

[ ]:
```
mols_potassium_permanganate =␣
 ↪sodium_oxalate["KMNO4(mL)"]*1e-3*mean_M_potassium_permanganate
mols_sodium_oxalate = mols_potassium_permanganate*(5/2)
mass_sodium_oxalate = mols_sodium_oxalate*134
concetration = ( mass_sodium_oxalate/sodium_oxalate["m(g)"] )* 100
mean_concetration = round( concetration.mean()  )
std_concetration = round( concetration.std() )

"The sample has a concetration of ("+str(mean_concetration)+" +-␣
 ↪"+str(std_concetration) + ")%"
```

[ ]:
```
'The sample has a concetration of (63 +- 1)%'
```