analysis

May 8, 2023

1 Modules

```python
import pandas as pd
```

2 Data

```python
titulationNaOH = pd.read_csv("NaOH.txt")
titulationHCl = pd.read_csv("HCl.txt")
```

```python
titulationNaOH
```

```
   potassium-acid-phthalate(g)  NaOH(L)
0                         0.31   0.0157
1                         0.30   0.0156
2                         0.30   0.0154
3                         0.33   0.0159
4                         0.29   0.0149
5                         0.30   0.0149
6                         0.31   0.0152
7                         0.31   0.0153
8                         0.30   0.0150
9                         0.32   0.0155
```

```python
titulationHCl
```

```
   HCl(L)  NaOH(L)
0    0.01   0.0107
1    0.01   0.0106
2    0.01   0.0106
3    0.01   0.0109
4    0.01   0.0107
5    0.01   0.0107
6    0.01   0.0108
7    0.01   0.0106
8    0.01   0.0105
9    0.01   0.0108
```

3 Titulation $NaOH$

3.1 Quantity(g) of potassium acid phthalate

$15 \cdot 10^{-3} L \cdot \frac{1 mol}{L} \cdot 1 \cdot 204 g/mol = 3.06 g$

```
[ ]: NaOH_mols = ( titulationNaOH["potassium-acid-phthalate(g)"] / 204 )
     NaOH_M = ( titulationNaOH["potassium-acid-phthalate(g)"] / 204 ) / (␣
       ↪titulationNaOH["NaOH(L)"]  )
     mean_NaOH_M = NaOH_M.mean().round(4)


     "NaOH mols = (" + str( NaOH_mols.mean().round(4) ) +"+-" + str(  ␣
       ↪round(NaOH_mols.std(),4)    )+") mols,     Concetration NaOH = (" + str(␣
       ↪mean_NaOH_M ) +"+-" +str(    round( NaOH_M.std(),3  )                ) +") M "
```

```
[ ]: 'NaOH mols = (0.0015+-0.0001) mols,     Concetration NaOH = (0.0981+-0.003) M '
```

4 Titulation HCl

```
[ ]: HCl_M = (titulationHCl["NaOH(L)"] * mean_NaOH_M )/ ( titulationHCl["HCl(L)"] )

     "Concetration HCl = (" + str( HCl_M.mean().round(3) ) +"+-" +str(     round(␣
       ↪NaOH_M.std(),3  )               ) +") M "
```

```
[ ]: 'Concetration HCl = (0.105+-0.003) M '
```