In [77]:

```
#Import Libraries
import numpy as np
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
import math
import scipy
```

In [144…

```
#Declare Parameters
time_hrs = np.arange(0.1,4.1,0.1)
time_sec = time_hrs * 3600
temp = np.arange(1073.0,1228.0,5)
#Declare Variables
D=[]
erf=[]
Cs = []
P = []
cost=[]
info = []

#Find D
for j in temp:
        D.append(((2.3*(10**-5))*math.exp((-148000)/(j * 8.314))))
#Find Erf
for i in time_sec:
    for j in D:
        erf.append(math.erf((0.2*10**-3)/(2*(math.sqrt(i*j)))))


#Find Cs
for i in erf:
    Cs.append(((0.6-0.3) / (1-i)) + 0.3)
#Find P
for i in range(0,len(time_sec)):
    for j in temp:
        P.append((Cs[i]/(0.007 * math.exp(-20000/(8.314 *(j))))))**2)


P_Psi = [i/6894.7572931783 for i in P] #Convert to PSI

#Find cost
for i in range(0,len(time_sec)):
    for j in temp:
        cost.append([1*(time_sec[i]/60) + 0.18*((j-(20+273.15))*(time_sec[i]/3600)) +
                     (1-(math.erf((0.2*10**-3)/(2*(math.sqrt(time_sec[i]*(((2.3*(10**-5
                     (j * 8.314)))))))))) + 0.3)/(0.007 * math.exp(-20000/(8.314 *(j))
                      (time_sec[i]/3600))])
        info.append([time_sec[i],j])




print(f"""The Lowest cost is: {np.amin(cost)}.
      \nThe total time taken in mins: {info[123][0]/60}.
      \nThe temperature used: {info[123][1]}K.
      \nThe temperature used in Celcius: {info[123][1]-273}C""")
```

```
The Lowest cost is: 303.7286117834561.

The total time taken in mins: 24.0.

The temperature used: 1223.0K.

The temperature used in Celcius: 950.0C
```