Graphiques des pressions partielles de systèmes non-idéaux

<sxh python; title : pressions_partielles_systemes_non_ideaux.py> #!/usr/bin/env python # -*- coding: utf-8 -*- “”” Graphiques des pressions partielles de systèmes non-idéaux Basé sur le travail de ML et VM, ba2 chimie 2013-2014 ”””

import numpy as np import matplotlib.pyplot as plt from Tkinter import*

#données R = 0.082 #cste des gaz parfaits T = 293 # temperature cste (k) U01 = np.array([343,330,328,313,308,295,290,284,275,274,263,262,254,252,250,246,242,241,233,232,227,225,217,207,180,124,121,110,103,86,73,62,0]) #[0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20] #potientiel chimique standard, donnee = exemple U02 = np.array([0,110,122,191,206,259,272,284,323,328,357,361,381,382,390,394,403,405,419,420,427,428,438,447,465,490,489,491,491,495,502,501,513]) a1 = np.array([0,0.061,0.071,0.121,0.133,0.185,0.198,0.209,0.275,0.288,0.35,0.356,0.405,0.414,0.447,0.452,0.492,0.498,0.569,0.572,0.612,0.615,0.67,0.72,0.828,0.918,0.923,0.934,0.939,0.954,0.961,0.969,1])#f represente le rapport des constituants, o etant le constituant 1 et p le consituant 2 par ex a2 = np.ones(1)-a1

x1 = np.array([0,0.1891,0.3851,0.5945,0.8243,1]) x2 = np.ones(1)-x1 U03 = np.array([80]) U04 = np.array([45])

def graph1():

```
  U1= (np.log(a1)*R*T)+U01
  U2= (np.log(a2)*R*T)+U02
  plt.figure(1)
  plt.plot(a1,U1,'r''x''-')
  plt.plot(a1,U2,'g''o''-')
  plt.plot(a1, U1+U2,'b')
  plt.xlabel ('fraction molaire des constituants')
  plt.ylabel ('pression en mmHg')
  plt.title ('diagramme de l acetone et du CS2')
  plt.legend(("acetone","CS2","somme des 2"),'best')
  plt.show()
```

def graph2():

```
  U3= (np.log(x1)*R*T)+U03
  U4= (np.log(x2)*R*T)+U04
  plt.figure(2)
  plt.plot(x2,U3,'b''-')
  plt.plot(x2,U4,'g''x''-')
  plt.plot(x2, U3+U4,'k''o''-')
  plt.xlabel ('fraction molaire des constituants')
  plt.ylabel ('pression en mmHg')
  plt.title ('diagramme du benzene et du toluene')
```

```
  plt.legend(("benzene","toluene","somme des 2"),'best')
  plt.show()
```

def graph3 ():

```
  U1= (np.log(a1)*R*T)+U01
  U2= (np.log(a2)*R*T)+U02
  U3= (np.log(x1)*R*T)+U03
  U4= (np.log(x2)*R*T)+U04
  plt.figure(3)
```

```
  plt.subplot(121)
  plt.plot(a1,U1,'r''x''-')
  plt.plot(a1,U2,'g''o''-')
  plt.plot(a1, U1+U2,'b')
  plt.xlabel ('fraction molaire des constituants')
  plt.ylabel ('pression en mmHg')
  plt.title ('diagramme de l acetone et du CS2')
  plt.legend(("acetone","CS2","somme des 2"),'best')
```

```
  plt.subplot(122)
  plt.plot(x2,U3,'b''-')
  plt.plot(x2,U4,'y''x''-')
  plt.plot(x2, U3+U4,'k''o''-')
  plt.xlabel ('fraction molaire des constituants')
  plt.ylabel ('pression en mmHg')
  plt.title ('diagramme du benzene et du toluene')
  plt.legend(("benzene","toluene","somme des 2"),'best')
```

```
  plt.show()
```

def abientot ():

```
  print "en esperant vous revoir bientôt !"
  fen1.destroy()
```

fen1 = Tk() fen1.title(“diagramme des cas non ideaux et ideaux”)

#création widget

Label(fen1, text=“choisissez votre diagramme parmis les propositions ci dessous :”, bg=“orange”, fg=“black”).grid(row=2, column=1,columnspan=2, padx=3, pady=3) Button(fen1, text=“acetone CS2”, command=graph1, bg=“yellow”, fg=“black”).grid(row=3, column=0, columnspan=2) Button(fen1, text=“benzene toluene”, command=graph2, bg=“blue”, fg=“white”).grid(row=3, column=2, columnspan=2) Button(fen1, text=“comparatif des 2 diagrammes”, command=graph3, bg=“green”,fg=“black”).grid(row=3,column=4,columnspan=2) Button(fen1, text=“quitter”, command=abientot, bg=“red”, fg=“black”).grid(row=5, column=2, columnspan=2)

fen1.mainloop()

</sxh>