## Notebook

January 16, 2020

NBBinder test on a collection of notebooks about some thermodynamic properperties of water

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# 1 Reading the Data

A table with the variation of density and viscosity in terms of the temperature, at a fixed pressure of 1 atmosphere, is available in Batchelor (2000). The data has been digitized and saved into a local csv file. Here we load the table from the file and view and plot the data.

## 1.1 Importing the libraries

First we import the libraries used in this particular notebook.

```
[1]: import pandas as pd import matplotlib.pyplot as plt
```

#### 1.2 Using pandas

The data has been digitized to the local file water.csv. An easy way to retrieve it is with the pandas.read csv() function of the pandas library:

```
[2]: water_pd = pd.read_csv('water.csv', header=[0,1])
```

#### 1.2.1 Viewing the data with pandas

The data is diplayed nicely with pandas:

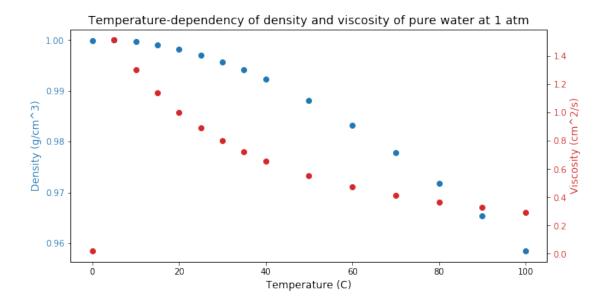
```
[3]: water_pd
```

[3]: temp density viscosity
Temperature (C) Density (g/cm<sup>2</sup>) Viscosity (cm<sup>2</sup>/s)

0	0	0.9999	0.01787
1	5	1.0000	1.51400
2	10	0.9997	1.30400
3	15	0.9991	1.13800
4	20	0.9982	1.00400
5	25	0.9971	0.89400
6	30	0.9957	0.80200
7	35	0.9941	0.72500
8	40	0.9923	0.65900
9	50	0.9881	0.55400
10	60	0.9832	0.47500
11	70	0.9778	0.41400
12	80	0.9718	0.36600
13	90	0.9653	0.32700
14	100	0.9584	0.29500

## 1.2.2 Plotting the data

We may also visualize both variations of density and viscosity using matplotlib.pyplot:



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