Saturated vapour pressure

The saturated vapour pressure can be calculated using a number of equations. A commonly used equation is that proposed by WMO in the Guide to Meteorological Instruments and Methods of Observation (CIMO Guide by WMO, 2008) [1)]

$$e_s = 0.61120*exp \left (\frac {17.62*T}{243.12+T} \right) $$

where the temperature is given in degress Celsius and the resulting vapour pressure is in kPa. This type of equation can be found in different varieties, with slightly different coefficients (see e.g. [2)])

sat-vap.py

```
from pylab import *
def es(t):
    e = 0.6112*exp(17.62*t/(243.12+t))
    return e
t = arange(0.0, 35.0, 0.5)
plot(t, es(t))
ytext = ylabel('saturated vapour pressure in kPa')
xtext = xlabel('temperature')
show()
```

1 mb corresponds to 100 Pa (Pascal) or to 1 hPa (hecto-Pascal) or to 0.1 kPa (kPascal). The normal atmospheric pressure (atm) is about 1013 mb or 1013 hPa or 101,3 kPa. The above formula gives the vapour pressure in kPa. A note of care: There is significant confusion about formulae, coefficients and units in the existing literature.

[1)] Guide to Meteorological Instruments and Methods of Observation, WMO Publication No 8, 7th edition, Geneva, 2008.
[2)] Buck Research Manual (1996); updated equation from Buck, A. L., New equations for computing vapor pressure and enhancement factor, J. Appl. Meteorol., 20, 1527-1532, 1981