```python
from __future__ import division
from numpy import zeros, cos, sin, complex, array, asarray, reshape
from numpy.linalg import lstsq
from math import pi
import numpy as np

omega = 2*pi/22.6
phase = 0
ampl = 4


# Read signal
t, signal = np.loadtxt('visc_data_4m.txt', unpack=True)
sieve = t > 30
t2 = t[sieve]
signal2 = signal[sieve]

N = len(t2)
Mx = zeros((N, 5), float)

v = ampl*omega*cos(omega*t2 + phase)
a = -ampl*omega**2*sin(omega*t2 + phase)
Mx[:,0] = 1
Mx[:,1] = v
Mx[:,2] = v*np.abs(v)
Mx[:,3] = a
Mx[:,4] = a*np.abs(a)

# Perform least square fit
(p, residuals, rank, s) = lstsq(Mx, signal2)

print p

# Best fit signal
const = p[0]
res = np.dot(Mx, p)

import matplotlib.pyplot as plt
plt.plot(t, signal, 'k', lw=2, label='Original')
plt.plot(t2, res, label='Best fit')
for i in range(5):
    plt.plot(t2, Mx[:,i]*p[i], label='Column %d' % i)
plt.legend()
plt.show()
```