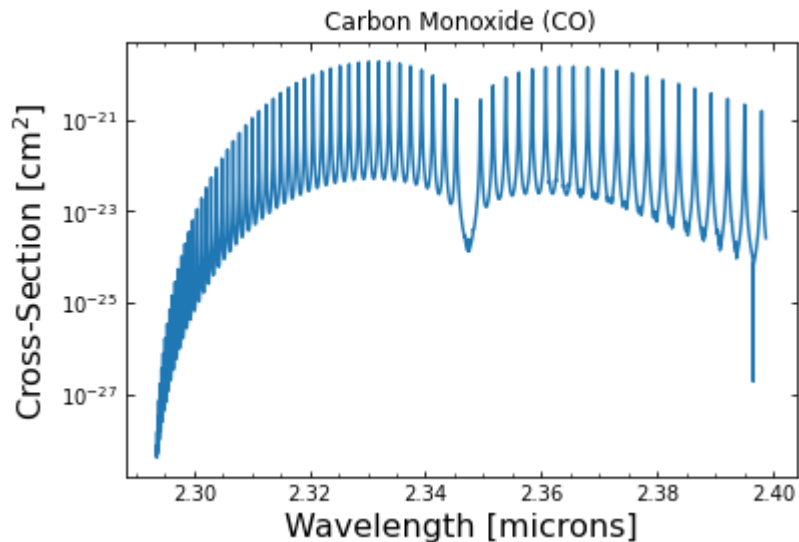


```
In [3]: # Load the cross-section data, in cm2:
wavenumber, crossSection = hapi.absorptionCoefficient_Lorentz(SourceTa

wavelength = 1e4 / wavenumber # convert from 1/cm to microns

py.figure()
py.semilogy(wavelength, crossSection)
py.xlabel('Wavelength [microns]', fontsize=16)
py.ylabel('Cross-Section [cm2]', fontsize=16)
py.title('Carbon Monoxide (CO)')
ax = plt.gca()
ax.text(0.5, 1.0, 'Carbon Monoxide (CO)')
ax.set_xlabel('Wavelength [microns]')
ax.set_ylabel('Cross-Section [cm2]')
ax.set_title('Carbon Monoxide (CO)')
```

Out[3]: Text(0.5, 1.0, 'Carbon Monoxide (CO)')



```
In [13]: import tools

n_CO = 1e11 # per cm3
absorption_coef = n_CO * crossSection # 1/cm

deltaX = 2000 * 1000 * 100 # 2000 km, in cm
opticalDepth = absorption_coef * deltaX

deepBlackbody = tools.blam(6000, wavelength) # 6000K blackbody spec
shallowBlackbody = tools.blam(3000, wavelength) # 3000K blackbody spec

emergentIntensity = deepBlackbody * (1. - opticalDepth) +

py.figure()
py.plot(wavelength, opticalDepth, '-k')
py.xlabel('Wavelength [microns]', fontsize=16)
py.ylabel('Optical Depth', fontsize=16)

py.figure()
py.plot(wavelength, deepBlackbody, '-b', label='6000 K blackbody (deep)')
py.plot(wavelength, shallowBlackbody, '-r', label='3000 K blackbody (shallow)')
py.plot(wavelength, emergentIntensity, '-g', label='Emergent Intensity')
py.plot(wavelength, deepBlackbody, '-b')
```

```
py.legend()  
py.xlabel('Wavelength [microns]', fontsize=16)  
py.ylabel('Specific Intensity', fontsize=16)
```

Out[13]: Text(0, 0.5, 'Specific Intensity')

