EOS

* Air pressure,
* Air temperature,
* Gas universal constant,
* Molar concentrations of the O2 and N2 gas species are calculated below:

Concentration of O2 = ; use as boundary condition

Concentration of N2 = ; use as boundary condition

Graphite grade: NBG-18

Geometry

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Configuration | Avg. bulk () | Dimensions (m)  (use symmetry assumption as needed) | Coordinate | Parameter “z” |
| 1. Thin cylinder | 1799 | R = 0.00425, L/2 = 0.01905 | RZ | 3.503E-3 |
| 2. Thick cylinder | 1845 | R = 0.0127, L/2 = 0.0254 | RZ | 1.095E-3 |
| 3. Thin plate | 1852 | **X/2 = 0.0025**, Y/2 = 0.0127, Z/2 = 0.0254 | XYZ (3D) | 7.150E-4 |
| 4. Thick plate | 1850 | **X/2 = 0.0075**, Y/2 = 0.0127, Z/2 = 0.0254 | XYZ (3D) | 8.660E-4 |
| 5. Sphere | 1855 | R = 0.0127 | RSPHERICAL | 6.050E-4 |

R = Radius (calculated from diameter); L = Length.

Functional form of parameter “z”:

Simulation stop criteria: total mass loss >= 25%

What to plot?

* Material attributes along the symmetry lines for all timesteps. (See the timestep.XXX.csv files)
* Remaining Mass (%) versus Time (hours). See below the instruction. “$2” means 2nd column.

Remaining Mass (%) versus Time (hours)

**[1] Thin cylinder: mesh resolution = 50x100; rate\_scaling\_factor = 0.0072**

plot 'out-NBG-18\_650C\_1\_RZ.csv' using ($1/3600):(($2/0.00425/0.00425/3.14/0.01905)/1799\*100)

**[2] Thick cylinder: mesh resolution = 50x100; rate\_scaling\_factor = 0.004**

plot 'out-NBG-18\_650C\_2\_RZ.csv' using ($1/3600):(($2/0.0127/0.0127/3.14/0.0254)/1845\*100)

**[3] Thin plate: mesh resolution = 25x25x25; rate\_scaling\_factor = 0.0056**

plot 'out-NBG-18\_650C\_3\_XYZ.csv' using ($1/3600):(($2/0.0025/0.0127/0.0254)/1852\*100)

**[4] Thick plate: mesh resolution = 25x25x25; rate\_scaling\_factor = 0.004**

plot 'out-NBG-18\_650C\_4\_XYZ.csv' using ($1/3600):(($2/0.0075/0.0127/0.0254)/1850\*100)

**[5] Sphere: mesh resolution = 100; rate\_scaling\_factor = 0.00375**

plot 'out-NBG-18\_650C\_5\_RSPHERICAL.csv' using ($1/3600):(($2\*3/4/3.14/0.0127/0.0127/0.0127)/1855\*100)