**Discretized Version for Thesis**

Conditions for Problem as found in paper (1226) for pseudo homogenous Model

|  |  |
| --- | --- |
| **Initial Conditions for t=0** | **Boundary Condition (BC)** |
|  | for z = 0 |
|  | Heat flux, for z=L |
|  | Diffusion flux, for z=L |
|  | for z=0 |

Uz

Cell centre values

Wj, T,P,,P

The general form of the continuity equation is

………….from equation(9) to get pressure variation

The continuity becomes

………………………..(4.1)

From equation (11)

……………………….(11)

Equation 11 becomes

…………………………….(11.1)

Introducing a constant , ……………(11.2)

…………………………………(11.3)

Substituting equation 11.3 into equation 4.1 yields

………………………..(4.1)

The final form of the continuity equation before discretizing gives

Discretizing the above yields

=0

Discretizing the above yields

=0

**For cell 1**

=0

LB=Left boundary which is the same as BW=West boundary

+

+

+

**For cell nz**

=0

**Temperature Equation**

The general energy equation given by equation 14

From equation (16)

+

Simplifying further

+

Where the source term is

Simplifying further yields

Assuming

Where k is the thermal conductivity

**For cell 1**

**For cell nz**

Using this boundary condition

At z=L,

At z=0, T=

Using the exit BC at z=L gives

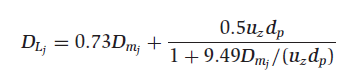
**Species Mass Fraction**

From equation (4), the species equation is given as

The general form of the species equation is given by

Where as

Axial diffusion coefficient is given by



………………..(4.1)

Where the reaction source term,

Discretizing equation (4.1)

…

=+

Using the following boundary conditions

At z=L,

At z=0, w=

**For cell 1**

Grouping liketerms

NB: Any parameter to the subscript 1-1 is the parameter value at the boundary .

**For cell nz**

Grouping the above and applying exit BC

With BC, the above equation becomes