FINAL CODE IN X VECTOR

x(1)= 1;

x(2)= 1;

x(3)= 0.00987437377586528

x(4)= 0.000187052331942300

x(5)= 210.579571204135

x(6)= 0.00999902055116399

x(7)= 67.1758257515622

elec = 20e-03;

tao = 5000;

Cph = 1122;

Cpc = 1073;

mc = 2;

mh = 1.66;

TempH = 900;

TempC = 200;

Prh = 0.731;

Prc = 0.694;

x(1) = 0.793;

x(2) = 1;

x(3) = 10e-03;

x(3) = 10e-03;

x(4) = 0.2e-03;

x(4) = 0.2e-03;

x(5) = 218;

x(5) = 218;

x(6) = 7e-03;

x(7) = 74;

Cmin = mh \* Cph;

Cmax = mc \* Cpc;

Cr = Cmin / Cmax;

roi = 0.1;

Z = 10;

Acf = (roi)/(1-(1+roi)^-Z);

Ah = x(1)\*x(2)\*x(7)\*(1+2\*x(5)\*(x(3)-x(4)));

Ac = x(1)\*x(2)\*x(7)\*(1+2\*x(5)\*(x(3)-x(4)));

A = (x(1)\*x(2)\*x(7)\*(1+2\*x(5)\*(x(3)-x(4)))) + (x(1)\*x(2)\*x(7)\*(1+2\*x(5)\*(x(3)-x(4))));

Affh = (x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7);

Affc = (x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1);

Lc = x(3) - 2\*x(4) + x(7)\*(2\*x(3)+2\*x(4));

Gh = 1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7));

Gc = 2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1));

fs = ((1 / x(5) ) - x(4));

dhh = ((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)));

dhc = ((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)));

alpha = ((1 / x(5) ) - x(4)) / (x(3) - x(4));

sigma = x(4) / x(6);

gamma = x(4) / ((1 / x(5) ) - x(4));

Reh = ((1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))/4.01e-05;

Rec = ((2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4))))) / 3.36e-05;

jh = (0.6522\*(((1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))/4.01e-05)^-0.5403\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^-0.1541\*( x(4) / x(6))^0.1499\*( x(4) / ((1 / x(5) ) - x(4)))^-0.0678)\*(1+5.269e-05\*(((1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))/4.01e-05)^1.34\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^0.504\*( x(4) / x(6))^0.456\*( x(4) / ((1 / x(5) ) - x(4)))^-1.055)^0.1;

jc = (0.6522\*(((2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4))))) / 3.36e-05)^-0.5403\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^-0.1541\*( x(4) / x(6))^0.1499\*( x(4) / ((1 / x(5) ) - x(4)))^-0.0678)\*(1+5.269e-05\*(((2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4))))) / 3.36e-05)^1.34\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^0.504\*( x(4) / x(6))^0.456\*( x(4) / ((1 / x(5) ) - x(4)))^-1.055)^0.1;

fh = (9.6243\*(((1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))/4.01e-05)^-0.7422\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^-0.1856\*( x(4) / x(6))^0.3053\*( x(4) / ((1 / x(5) ) - x(4)))^-0.2659)\*(1+7.669e-08\*(((1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))/4.01e-05)^4.429\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^0.920\*( x(4) / x(6))^3.767\*( x(4) / ((1 / x(5) ) - x(4)))^0.236)^0.1;

fc = (9.6243\*(((2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4))))) / 3.36e-05)^-0.7422\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^-0.1856\*( x(4) / x(6))^0.3053\*( x(4) / ((1 / x(5) ) - x(4)))^-0.2659)\*(1+7.669e-08\*(((2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4))))) / 3.36e-05)^4.429\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^0.920\*( x(4) / x(6))^3.767\*( x(4) / ((1 / x(5) ) - x(4)))^0.236)^0.1;

hh = (((0.6522\*(((1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))/4.01e-05)^-0.5403\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^-0.1541\*( x(4) / x(6))^0.1499\*( x(4) / ((1 / x(5) ) - x(4)))^-0.0678)\*(1+5.269e-05\*(((1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))/4.01e-05)^1.34\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^0.504\*( x(4) / x(6))^0.456\*( x(4) / ((1 / x(5) ) - x(4)))^-1.055)^0.1) \*(1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7)))\* 1122 \* 0.731^(-2/3))\*10^-3;

hc = (((0.6522\*(((2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4))))) / 3.36e-05)^-0.5403\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^-0.1541\*( x(4) / x(6))^0.1499\*( x(4) / ((1 / x(5) ) - x(4)))^-0.0678)\*(1+5.269e-05\*(((2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4))))) / 3.36e-05)^1.34\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^0.504\*( x(4) / x(6))^0.456\*( x(4) / ((1 / x(5) ) - x(4)))^-1.055)^0.1) \* (2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* 1073 \* 0.694^(-2/3))\*10^-3;

UA = 1 / ((1/(((((0.6522\*(((1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))/4.01e-05)^-0.5403\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^-0.1541\*( x(4) / x(6))^0.1499\*( x(4) / ((1 / x(5) ) - x(4)))^-0.0678)\*(1+5.269e-05\*(((1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))/4.01e-05)^1.34\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^0.504\*( x(4) / x(6))^0.456\*( x(4) / ((1 / x(5) ) - x(4)))^-1.055)^0.1) \*(1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7)))\* 1122 \* 0.731^(-2/3))\*10^-3)\*( x(1)\*x(2)\*x(7)\*(1+2\*x(5)\*(x(3)-x(4))))))+(1/(((((0.6522\*(((2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4))))) / 3.36e-05)^-0.5403\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^-0.1541\*( x(4) / x(6))^0.1499\*( x(4) / ((1 / x(5) ) - x(4)))^-0.0678)\*(1+5.269e-05\*(((2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4))))) / 3.36e-05)^1.34\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^0.504\*( x(4) / x(6))^0.456\*( x(4) / ((1 / x(5) ) - x(4)))^-1.055)^0.1) \* (2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* 1073 \* 0.694^(-2/3))\*10^-3)\*( x(1)\*x(2)\*x(7)\*(1+2\*x(5)\*(x(3)-x(4)))))));

NTU = ((1 / ((1/(((((0.6522\*(((1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))/4.01e-05)^-0.5403\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^-0.1541\*( x(4) / x(6))^0.1499\*( x(4) / ((1 / x(5) ) - x(4)))^-0.0678)\*(1+5.269e-05\*(((1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))/4.01e-05)^1.34\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^0.504\*( x(4) / x(6))^0.456\*( x(4) / ((1 / x(5) ) - x(4)))^-1.055)^0.1) \*(1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7)))\* 1122 \* 0.731^(-2/3))\*10^-3)\*( x(1)\*x(2)\*x(7)\*(1+2\*x(5)\*(x(3)-x(4))))))+(1/(((((0.6522\*(((2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4))))) / 3.36e-05)^-0.5403\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^-0.1541\*( x(4) / x(6))^0.1499\*( x(4) / ((1 / x(5) ) - x(4)))^-0.0678)\*(1+5.269e-05\*(((2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4))))) / 3.36e-05)^1.34\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^0.504\*( x(4) / x(6))^0.456\*( x(4) / ((1 / x(5) ) - x(4)))^-1.055)^0.1) \* (2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* 1073 \* 0.694^(-2/3))\*10^-3)\*( x(1)\*x(2)\*x(7)\*(1+2\*x(5)\*(x(3)-x(4)))))))) / (mh \* Cph))\*10^3;

effectiveness = 1 - exp((1/Cr)\*( ((1 / ((1/(((((0.6522\*(((1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))/4.01e-05)^-0.5403\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^-0.1541\*( x(4) / x(6))^0.1499\*( x(4) / ((1 / x(5) ) - x(4)))^-0.0678)\*(1+5.269e-05\*(((1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))/4.01e-05)^1.34\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^0.504\*( x(4) / x(6))^0.456\*( x(4) / ((1 / x(5) ) - x(4)))^-1.055)^0.1) \*(1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7)))\* 1122 \* 0.731^(-2/3))\*10^-3)\*( x(1)\*x(2)\*x(7)\*(1+2\*x(5)\*(x(3)-x(4))))))+(1/(((((0.6522\*(((2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4))))) / 3.36e-05)^-0.5403\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^-0.1541\*( x(4) / x(6))^0.1499\*( x(4) / ((1 / x(5) ) - x(4)))^-0.0678)\*(1+5.269e-05\*(((2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4))))) / 3.36e-05)^1.34\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^0.504\*( x(4) / x(6))^0.456\*( x(4) / ((1 / x(5) ) - x(4)))^-1.055)^0.1) \* (2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* 1073 \* 0.694^(-2/3))\*10^-3)\*( x(1)\*x(2)\*x(7)\*(1+2\*x(5)\*(x(3)-x(4)))))))) / (mh \* Cph))\*10^3)^0.22\*(exp(-Cr\*(((1 / ((1/(((((0.6522\*(((1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))/4.01e-05)^-0.5403\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^-0.1541\*( x(4) / x(6))^0.1499\*( x(4) / ((1 / x(5) ) - x(4)))^-0.0678)\*(1+5.269e-05\*(((1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))/4.01e-05)^1.34\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^0.504\*( x(4) / x(6))^0.456\*( x(4) / ((1 / x(5) ) - x(4)))^-1.055)^0.1) \*(1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7)))\* 1122 \* 0.731^(-2/3))\*10^-3)\*( x(1)\*x(2)\*x(7)\*(1+2\*x(5)\*(x(3)-x(4))))))+(1/(((((0.6522\*(((2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4))))) / 3.36e-05)^-0.5403\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^-0.1541\*( x(4) / x(6))^0.1499\*( x(4) / ((1 / x(5) ) - x(4)))^-0.0678)\*(1+5.269e-05\*(((2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4))))) / 3.36e-05)^1.34\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^0.504\*( x(4) / x(6))^0.456\*( x(4) / ((1 / x(5) ) - x(4)))^-1.055)^0.1) \* (2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* 1073 \* 0.694^(-2/3))\*10^-3)\*( x(1)\*x(2)\*x(7)\*(1+2\*x(5)\*(x(3)-x(4)))))))) / (mh \* Cph))\*10^3)^0.78)-1));

Q = ((1 - exp((1/Cr)\*( ((1 / ((1/(((((0.6522\*(((1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))/4.01e-05)^-0.5403\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^-0.1541\*( x(4) / x(6))^0.1499\*( x(4) / ((1 / x(5) ) - x(4)))^-0.0678)\*(1+5.269e-05\*(((1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))/4.01e-05)^1.34\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^0.504\*( x(4) / x(6))^0.456\*( x(4) / ((1 / x(5) ) - x(4)))^-1.055)^0.1) \*(1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7)))\* 1122 \* 0.731^(-2/3))\*10^-3)\*( x(1)\*x(2)\*x(7)\*(1+2\*x(5)\*(x(3)-x(4))))))+(1/(((((0.6522\*(((2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4))))) / 3.36e-05)^-0.5403\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^-0.1541\*( x(4) / x(6))^0.1499\*( x(4) / ((1 / x(5) ) - x(4)))^-0.0678)\*(1+5.269e-05\*(((2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4))))) / 3.36e-05)^1.34\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^0.504\*( x(4) / x(6))^0.456\*( x(4) / ((1 / x(5) ) - x(4)))^-1.055)^0.1) \* (2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* 1073 \* 0.694^(-2/3))\*10^-3)\*( x(1)\*x(2)\*x(7)\*(1+2\*x(5)\*(x(3)-x(4)))))))) / (mh \* Cph))\*10^3)^0.22\*(exp(-Cr\*(((1 / ((1/(((((0.6522\*(((1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))/4.01e-05)^-0.5403\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^-0.1541\*( x(4) / x(6))^0.1499\*( x(4) / ((1 / x(5) ) - x(4)))^-0.0678)\*(1+5.269e-05\*(((1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))/4.01e-05)^1.34\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^0.504\*( x(4) / x(6))^0.456\*( x(4) / ((1 / x(5) ) - x(4)))^-1.055)^0.1) \*(1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7)))\* 1122 \* 0.731^(-2/3))\*10^-3)\*( x(1)\*x(2)\*x(7)\*(1+2\*x(5)\*(x(3)-x(4))))))+(1/(((((0.6522\*(((2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4))))) / 3.36e-05)^-0.5403\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^-0.1541\*( x(4) / x(6))^0.1499\*( x(4) / ((1 / x(5) ) - x(4)))^-0.0678)\*(1+5.269e-05\*(((2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4))))) / 3.36e-05)^1.34\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^0.504\*( x(4) / x(6))^0.456\*( x(4) / ((1 / x(5) ) - x(4)))^-1.055)^0.1) \* (2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* 1073 \* 0.694^(-2/3))\*10^-3)\*( x(1)\*x(2)\*x(7)\*(1+2\*x(5)\*(x(3)-x(4)))))))) / (mh \* Cph))\*10^3)^0.78)-1))) \* Cmin \* (TempH - TempC))\*10^-3;

Ph = ((2)\*( (9.6243\*(((1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))/4.01e-05)^-0.7422\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^-0.1856\*( x(4) / x(6))^0.3053\*( x(4) / ((1 / x(5) ) - x(4)))^-0.2659)\*(1+7.669e-08\*(((1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))/4.01e-05)^4.429\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^0.920\*( x(4) / x(6))^3.767\*( x(4) / ((1 / x(5) ) - x(4)))^0.236)^0.1)\*x(1)\*(( 1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7)))^2))/((0.6296)\*( ((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))\*10e-4;

Pc = ((2)\*( (9.6243\*(((2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4))))) / 3.36e-05)^-0.7422\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^-0.1856\*( x(4) / x(6))^0.3053\*( x(4) / ((1 / x(5) ) - x(4)))^-0.2659)\*(1+7.669e-08\*(((2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4))))) / 3.36e-05)^4.429\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^0.920\*( x(4) / x(6))^3.767\*( x(4) / ((1 / x(5) ) - x(4)))^0.236)^0.1)\*x(2)\*(( 2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1)))^2))/((0.9638)\*( ((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))\*10e-4;

Ccp = (Acf \* 90 \* ((x(1)\*x(2)\*x(7)\*(1+2\*x(5)\*(x(3)-x(4)))) + (x(1)\*x(2)\*x(7)\*(1+2\*x(5)\*(x(3)-x(4)))))^0.6);

Cop = ((tao\*elec\*(((2)\*( (9.6243\*(((1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))/4.01e-05)^-0.7422\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^-0.1856\*( x(4) / x(6))^0.3053\*( x(4) / ((1 / x(5) ) - x(4)))^-0.2659)\*(1+7.669e-08\*(((1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))/4.01e-05)^4.429\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^0.920\*( x(4) / x(6))^3.767\*( x(4) / ((1 / x(5) ) - x(4)))^0.236)^0.1)\*x(1)\*(( 1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7)))^2))/((0.6296)\*( ((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))\*10e-4)\*mh)/(0.6\*0.6296))+((tao\*elec\*(((2)\*( (9.6243\*(((2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4))))) / 3.36e-05)^-0.7422\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^-0.1856\*( x(4) / x(6))^0.3053\*( x(4) / ((1 / x(5) ) - x(4)))^-0.2659)\*(1+7.669e-08\*(((2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4))))) / 3.36e-05)^4.429\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^0.920\*( x(4) / x(6))^3.767\*( x(4) / ((1 / x(5) ) - x(4)))^0.236)^0.1)\*x(2)\*(( 2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1)))^2))/((0.9638)\*( ((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))\*10e-4)\*mc)/(0.6\*0.9638));

Of = ((Acf \* 90 \* ((x(1)\*x(2)\*x(7)\*(1+2\*x(5)\*(x(3)-x(4)))) + (x(1)\*x(2)\*x(7)\*(1+2\*x(5)\*(x(3)-x(4)))))^0.6)) + (((tao\*elec\*(((2)\*( (9.6243\*(((1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))/4.01e-05)^-0.7422\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^-0.1856\*( x(4) / x(6))^0.3053\*( x(4) / ((1 / x(5) ) - x(4)))^-0.2659)\*(1+7.669e-08\*(((1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))/4.01e-05)^4.429\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^0.920\*( x(4) / x(6))^3.767\*( x(4) / ((1 / x(5) ) - x(4)))^0.236)^0.1)\*x(1)\*(( 1.66 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(2)\*x(7)))^2))/((0.6296)\*( ((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))\*10e-4)\*mh)/(0.6\*0.6296))+((tao\*elec\*(((2)\*( (9.6243\*(((2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4))))) / 3.36e-05)^-0.7422\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^-0.1856\*( x(4) / x(6))^0.3053\*( x(4) / ((1 / x(5) ) - x(4)))^-0.2659)\*(1+7.669e-08\*(((2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1))) \* (((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4))))) / 3.36e-05)^4.429\*(((1 / x(5) ) - x(4)) / (x(3) - x(4)))^0.920\*( x(4) / x(6))^3.767\*( x(4) / ((1 / x(5) ) - x(4)))^0.236)^0.1)\*x(2)\*(( 2 / ((x(3) - x(4))\*(1 - x(5)\*x(4))\*x(1)\*(x(7)+1)))^2))/((0.9638)\*( ((4)\*(((1 / x(5) ) - x(4)))\*(x(6))\*(x(3) - x(4)))/(2\*((((1 / x(5) ) - x(4))\*x(6))+(x(3)-x(4))\*x(6)+(x(3) - x(4))\*x(4))+x(4)\*((1 / x(5) ) - x(4)))))\*10e-4)\*mc)/(0.6\*0.9638)));