

```

for jj=1:Nc
f_old = f_old+(Z(jj)*(K(jj)-1))/(1+n_g_guess*(K(jj)-1));
end

n_g = n_g_guess-0.0000001;
f_new=0;
for kk=1:Nc
    f_new=f_new+(Z(kk)*(K(kk)-1))/(1+n_g*(K(kk)-1));
end

n_g_new = n_g_guess-0.0000001*f_old/(f_old-f_new);

    delta_n_g=abs(n_g_new-n_g_guess);

n_g_guess=n_g_new;

end

result=n_g_guess;

for ll=1: numel(K)
    x(ll)=(Z(ll))/(1+n_g_new*(K(ll)-1));
end
y=K.*x;
%-----Mixture Properties-----
%calculate the mixture properties
a_mix_liq,a_mix_vap,b_mix_liq,b_mix_vap,a(ii,jj)
b_mix_liq=0;
b_mix_vap=0;

for ii=1: numel(Z)
    b_mix_liq=b_mix_liq+x(ii)*b(ii);
    b_mix_vap=b_mix_vap+y(ii)*b(ii);
end

for ii=1:Nc
    for jj=1:Nc
        a(ii,jj)=sqrt(a_T(ii)*a_T(jj))*(1-Kij(ii,jj));
    end
end

a_mix_liq=0;
a_mix_vap=0;
for ii=1:Nc
    for jj=1:Nc
        a_mix_liq=a_mix_liq+x(ii)*x(jj)*a(ii,jj);
        a_mix_vap=a_mix_vap+y(ii)*y(jj)*a(ii,jj);
    end
end

%---the non-dimension parameters for PR EOS A,B for both phases----
A_liq=(a_mix_liq*P)/(R*(T))^2;
B_liq=(b_mix_liq*P)/(R*(T));

```