

PeGn624 Homework # 18

- Assigned: Wednesday, March 25, 2009
- Due: Thursday, April 2, 2009 in class

1 Numerical Values

Calculate the numerical values of the matrix equations at the initial conditions for the project.

The primary variables are P_o , S_o , T . When $T < T_s$, $S_g = 0$ and T_s is used as the fourth primary variable. When $T \geq T_s$, S_g is used as the fourth primary variable.

1.2 Part (b): Revised Form, $T < T_s$

Eliminate zeros in A_{12} and adjust all terms in the appropriate rows. Calculate the numerical values for A_{31} , and R_{31} defined in Eq. 1.2. The X^* represents adjusted values based on eliminating zeros. The 0^* represents the values which have been eliminated. Use the initial conditions of $P_o = 500psia$ and $T_R = 100^\circ F$.

	A_{31}												δ			R_{31}			
W :	X*	X*	0*	0	X*	0	0	0	0	0	0	0	0	δP_o		X*			
O :	X*	X*	0*	0	X*	0	0	0	0	0	0	0	0	δT		X*			
E :	X	X	X	0	X	X	0	0	0	0	0	0	0	δS_o		X			
G :	X	0	X	X	0	0	0	0	0	0	0	0	0	δT_s		X			
W :	X*	0	0	0	X*	X*	0*	0	X*	0	0	0	δP_o		X*				
O :	X*	0	0	0	X*	X*	0*	0	X*	0	0	0	δT		X*				
E :	X	X	0	0	X	X	X	0	X	X	0	0	δS_o	=	X				
G :	0	0	0	0	X	0	X	X	0	0	0	0	δT_s		X				
W :	0	0	0	0	X*	0	0	0	X*	X*	0*	0	δP_o		X*				
O :	0	0	0	0	X*	0	0	0	X*	X*	0*	0	δT		X*				
E :	0	0	0	0	X	X	0	0	X	X	X	0	δS_o		X				
G :	0	0	0	0	0	0	0	0	X	0	X	X	δT_s		X				

1.3 Part (c): Extract Temperature and Pressure, $T < T_s$

Extract the pressure and temperatures from A_{41} . Calculate the numerical values for A_{41} , and R_{41} defined in Eq. 1.3. Use the initial conditions of $P_o = 500psia$ and $T_R = 100^\circ F$.

	A_{41}						δ			R_{41}			
	X	X	X	0	0	0	δP_o		X				
	X	X	X	0	0	0	δT		X				
	X	0	X	X	X	0	δP_o		X				
	X	0	X	X	X	0	δT		X				
	0	0	X	0	X	X	δP_o		X				
	0	0	X	0	X	X	δT		X				

1.5 Part (e): Revised Form, $T \geq T_s$

Eliminate zeros in A_{12} and adjust all terms in the appropriate rows. Calculate the numerical values for A_{31} , and R_{31} defined in Eq. 1.5. The X^* represents adjusted values based on eliminating zeros. The 0^* represents the values which have been eliminated. Use the conditions of $P_o = 500psia$ and $T = 500^\circ F$.

	A_{31}												δ			R_{31}				
W :	X*	X*	0*	0*	X*	0	0	0	0	0	0	0	\delta P_o	\delta T	\delta S_o	\delta S_g	X*	X*	X	(1.5)
O :	X*	X*	0*	0	X*	0	0	0	0	0	0	0	\delta P_o	\delta T	\delta S_o	\delta S_g	X*	X*	X	
E :	X*	X*	X*	0*	X*	X*	0	0	0	0	0	0	\delta P_o	\delta T	\delta S_o	\delta S_g	X*	X*	X	
G :	X	X	X	X	0	0	0	0	0	0	0	0	\delta P_o	\delta T	\delta S_o	\delta S_g	X*	X*	X	
W :	X*	0	0	0	X*	X*	0*	0*	X*	0	0	0	\delta P_o	\delta T	\delta S_o	\delta S_g	X*	X*	X	
O :	X*	0	0	0	X*	X*	0*	0	X*	0	0	0	\delta P_o	\delta T	\delta S_o	\delta S_g	X*	X*	X	
E :	X*	X*	0	0	X*	X*	X*	0*	X*	X*	0	0	\delta P_o	\delta T	\delta S_o	\delta S_g	X*	X*	X	
G :	0	0	0	0	X	X	X	X	0	0	0	0	\delta P_o	\delta T	\delta S_o	\delta S_g	X*	X*	X	
W :	0	0	0	0	X*	0	0	0	X*	X*	0*	0*	\delta P_o	\delta T	\delta S_o	\delta S_g	X*	X*	X	
O :	0	0	0	0	X*	0	0	0	X*	X*	0*	0	\delta P_o	\delta T	\delta S_o	\delta S_g	X*	X*	X	
E :	0	0	0	0	X*	X*	0	0	X*	X*	X*	0*	\delta P_o	\delta T	\delta S_o	\delta S_g	X*	X*	X	
G :	0	0	0	0	0	0	0	0	X	X	X	X	\delta P_o	\delta T	\delta S_o	\delta S_g	X*	X*	X	

1.6 Part (f): Extract Temperature and Pressure, $T \geq T_s$

Extract the pressure and temperatures from A_{41} . Calculate the numerical values for A_{41} , and R_{41} defined in Eq. 1.3. Use the conditions of $P_o = 500psia$ and $T = 500^\circ F$.