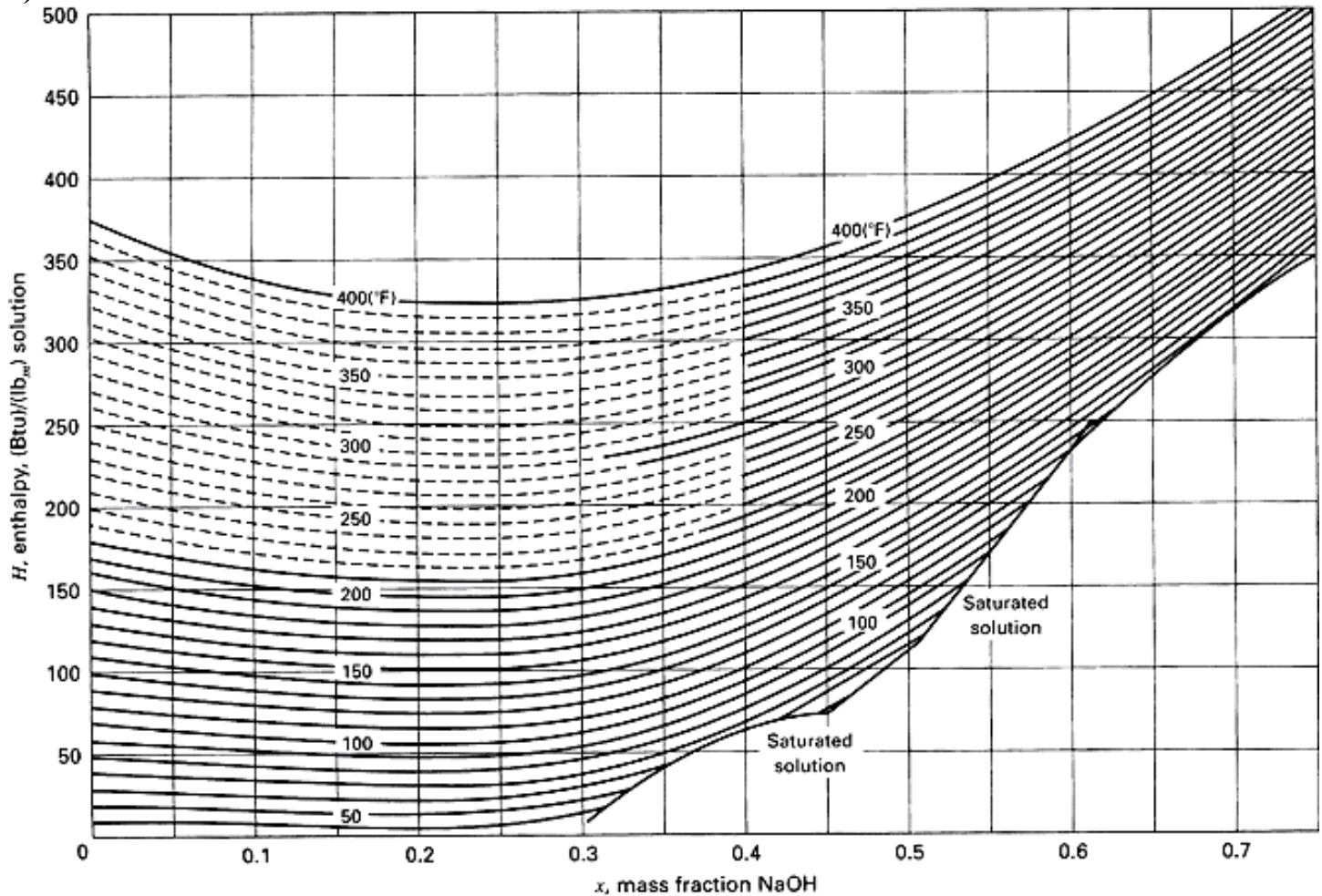
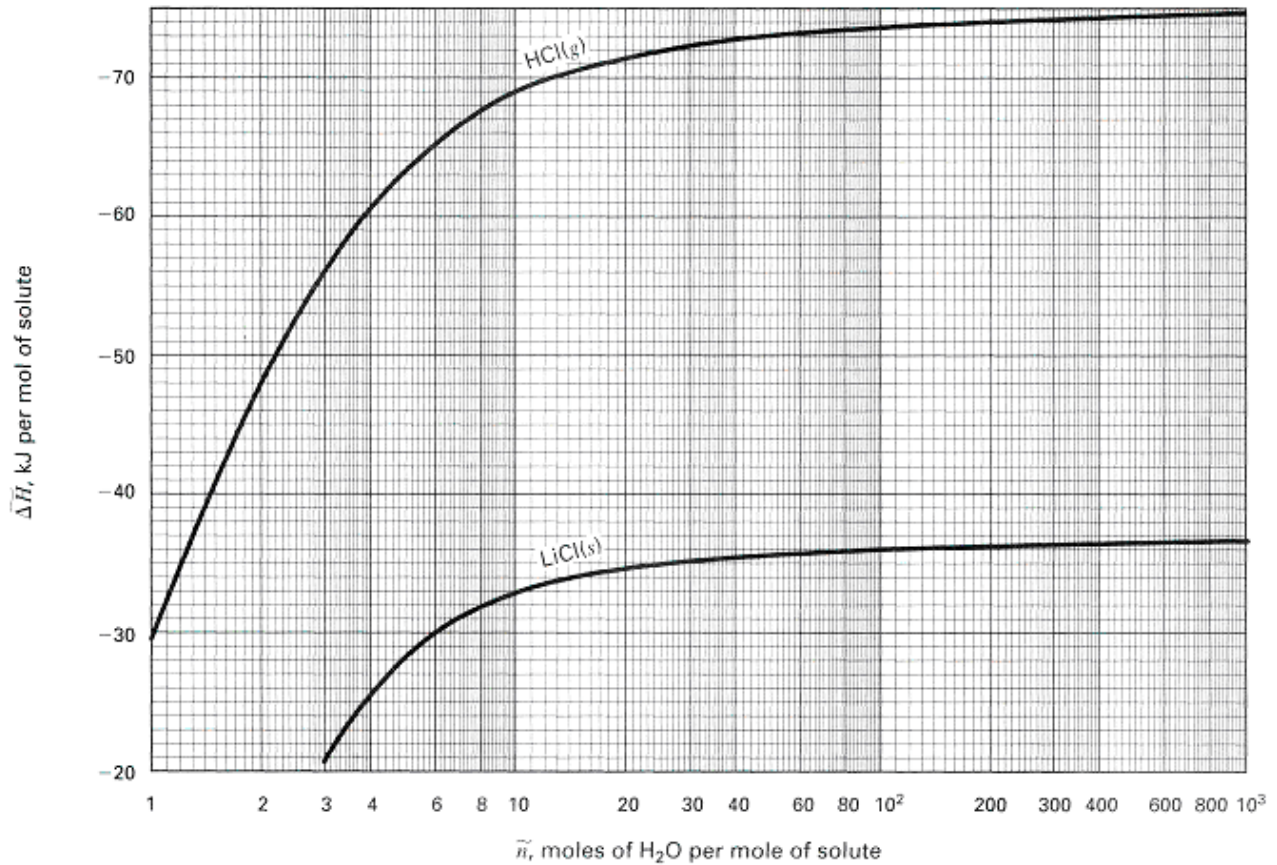


1)



- a) 10 lbm/hr solution of 50 mass% NaOH at 250°F is diluted with some water to produce a solution of 10% NaOH. This continuous flow process is carried out using an adiabatic tank. What is the water's temperature if temperature of 150°F is desired for the final mixture?
- b) How much water must be added in the process above?
- c) A process concentrates 50 lbm/hr of a 10% solution of NaOH to 50% by evaporation. The feed enters at 150°F while the concentrated NaOH solution leaves at 250°F. If 43,800 Btu/hr of heat is supplied to the process, what is the final pressure of the steam if it is also at 250°F?

2) The diagram below is for $T = 25^\circ\text{C}$:



- How much heat is required / released when we mix 20 mol/s of pure water and 2 mol/s of pure LiCl(s) at 25°C to produce a final mixture also at 25°C ? A stirrer used in this process operates on 1,000 W power.
- If we run the process adiabatically (instead of requiring the final solution to be at 25°C), will the final temperature be lower or higher than 25°C ?
- How much heat is required / released when we mix 20 mol/s of pure water and 2 mol/s of pure LiCl(s) initially at 50°C to produce a final mixture also at 25°C ? For this problem, ignore the stirrer's contribution.