Re: question on solution thermodynamics

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- *From*: rekuci@xxxxxxxxx
- *Date*: 16 Sep 2006 16:56:36 −0700

mrdarrett@xxxxxxxxx wrote:

> If I have a vessel filled with a liquid: 0.019 mole fraction ethanol
> and 0.981 mole fraction water (1.9 mole % ethanol, 98.1 mole % water),
> thermodynamic tables tell me that at 95.5 degrees C, the vapor will be
> 17 mole % ethanol, 83 mole % water.
>
> But what about if the temperature is not 95.5 degrees C?
>
> Between room temperature (20 C, for instance) and 95.5 C, will the
> vapor in equilibrium with the previously mentioned liquid still have 17
> mole % ethanol?

No, it definitely won't be the same. You'd expect that the percentage of ethanol in the vapor will increase with decreasing temperature, due to its higher volatility.

If you need quantities, the temperature−composition phase diagram (called the "T−x" diagram) for ethanol should be readily available in chemical reference works in your local university library, or here, but can't guarantee correctness:
http://www.physics.rutgers.edu/ugrad/351/Lecture%2016.ppt#267,16,Water−Ethanol Mixture

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