

Homework Set #6, Thermodynamics II

Due:4-15-97

One method of cooling air in arid climates is a swamp cooler. Air is forced through an evaporative chamber. In this case, 10 SCFM of air at 35°C, 15% RH is "cooled" by spraying 35°C liquid water into the air stream. Calculate the exit temperature, humidity ratio, and relative humidity. Calculate the entropy generation rate for the process.

Repeat the foregoing problem using the psychrometric chart (except for the entropy generation part).

Air enters an air conditioner at the rate of 20 SCFM at 30°C, 70% RH. The air exits the air conditioner at 15°C. Calculate the exiting RH, and, if appropriate, the rate at which water is removed from the air.