## Practice Problems

For this homework you can use EES, or the psychrometric charts to find the information you need to solve the problem.

**34-1:** 7000 m3/min of air at 28 °C and .101 MPa with a relative humidity of 60% is cooled at constant total pressure to its dew point. Determine the required heat transfer rate and indicate its direction (heat in, or heat out).

**34-2:** Wet and dry bulb temperatures for several cities are shown below. Use the psychrometric chart (in your supplement, or posted on our Canvas site) to determine the following for each city:

* relative humidity [%]
* humidity ratio [dim]
* dew point temperature [°C or °F]]
* partial pressure of water vapor [kPa or psia]

|  |  |  |
| --- | --- | --- |
| **City** | **Twb­** | **Tdb** |
| Berlin | 21.0 [°C] | 32.0 [°C] |
| Chicago | 75.0 [°F] | 97.0 [°F] |
| Hong Kong | 28.0 [°C] | 33.0 [°C] |

**34-3:** 30 cubic feet of air with a dry bulb temperature of 90 °F and a relative humidity of 80% will be taken through a 2-step cooling/dehumidification, followed by heating to get to a dry bulb temperature of 65 °F and a relative humidity of 50%. Determine the following for the cooling/dehumidification process:

(a) the wet bulb temperature of the air before dehumidification,

(b) the dew point temperature of air after dehumidification,

(c) the amount of moisture removed during the dehumidification process, and

(d) the amount of heat removed during the cooling part of the dehumidification process.