## 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] |

## Answers

**34-1:** Qdot ~ -1200 kJ/sec

**34-2:** Berlin: Relative Humidity = 0.37, humidity ratio = 0.011, TDB = 15.6 °C, and Pw = 1.77 kPa

Chicago: Relative Humidity = 0.36, humidity ratio = 0.0136, TDB = 65.8 °F, and Pw = 0.134 psia   
HK: Relative Humidity = 0.69, humidity ratio = 0.0219, TDB = 26.5 °C, and Pw = 3.45 kPa