



1. Is it possible to obtain saturated air from unsaturated air without adding any moisture? Explain.
2. Moist air is passed through a cooling section where it is cooled and dehumidified. How do (a) the specific humidity and (b) the relative humidity of air change during this process?
3. Can the water vapor in air be treated as an ideal gas? Explain.
4. How would you compare the enthalpy of water vapor at 20°C and 2 kPa with the enthalpy of water vapor at 20°C and 0.5 kPa?
5. How will (a) the specific humidity and (b) the relative humidity of the air contained in a well-sealed room change as it is heated?
6. An 8 m<sup>3</sup>-tank contains saturated air at 30°C, 105 kPa. Determine (a) the mass of dry air, (b) the specific humidity, and (c) the enthalpy of the air per unit mass of the dry air.
7. A tank contains 21 kg of dry air and 0.3 kg of water vapor at 30°C and 100 kPa total pressure. Determine (a) the specific humidity, (b) the relative humidity, and (c) the volume of the tank.
8. A room contains air at 20°C and 98 kPa at a relative humidity of 85 percent. Determine (a) the partial pressure of dry air, (b) the specific humidity of the air, and (c) the enthalpy per unit mass of dry air.
9. Determine the masses of dry air and the water vapor contained in a 240 m<sup>3</sup> room at 98 kPa, 23°C, and 50 percent relative humidity.
10. A house contains air at 25°C and 65 percent relative humidity. Will any moisture condense on the inner surfaces of the windows when the temperature of the window drops to 10°C?
11. After a long walk in the 8°C outdoors, a person wearing glasses enters a room at 25°C and 40 percent relative humidity. Determine whether the glasses will become fogged.
12. Repeat Prob. 11 for a relative humidity of 30 percent.
13. The dry- and wet-bulb temperatures of atmospheric air at 95 kPa are 25 and 17°C, respectively. Determine (a) the specific humidity, (b) the relative humidity, and (c) the enthalpy of the air, in kJ/kg dry air.
14. The air in a room has a dry-bulb temperature of 22°C and a wet-bulb temperature of 16°C. Assuming a pressure of 100 kPa, determine (a) the specific humidity, (b) the relative humidity, and (c) the dew-point temperature.