

ABE 202 Homework 1. 2017

1. Show that if variables X and Y are extensive, then X/Y is intensive.
2. What is the balance equation for anything?
3. As a result of a chemical spill in the Bio Lab, benzene is evaporating at the rate of 1 gram per minute into a room that is 8m X 4m X 3m in size and a ventilation rate of 10 cubic meters/min.
 - a. Compute the steady-state concentration of benzene in the room.
 - b. Assuming that benzene=0 at time =0 (beginning of spill), compute the time needed for benzene to reach 95 percent of the steady-state concentration.
4. The insecticide DDT has a half-life in the human body of approximately 7 years. (In 7 years its concentration decreases to half its initial concentration). Although DDT is no longer used in the United States, 25 years ago that average farmer had a body DDT concentration of 22ppm (parts per million by weight). Estimate what the farm workers present concentration is.