

Problem Set 1

- Due September 11, 2012 -

*An Introduction to Chemistry* (AIC)

Chapter 1 problems: 16, 18, 20, 22

Chapter 8 problems: 27, 29, 33, 35, 37, 43, 47, 51, 59, 61, 63, 65, 69, 73

*Consider a Spherical Cow* (COW)

pages 3-4 Exercises 2 and 4

pages 5, 6 Exercise 1

pages 7-9 Exercise 2

pages 24, 25 Exercise 2

1. How many liters of water do you expect to drink (in fluids of all kinds) in your lifetime? How many gallons is that? How many cubic meters is that? What is the mass in metric tons of that amount of water?
2. (a) Make a reasonable estimate of the mass of milk (cow, goat, llama, etc) consumed by people throughout the world each year, including milk products such as cheese and yogurt. (b) Based on your answer above, estimate the number of dairy animals in the world. How many is that per person?
3. The current global rate of erosion is estimated at 30 Gt of rock and soil washed into the sea each year. Historically (i.e. before there was a large human influence) the natural background erosion rate is estimated at 5 Gt/y. (a) At that rate (5 Gt/y), how many years would it take for all the continents above sea level to wash into the sea? (b) Given how much continental mass is now above sea level, how do you reconcile this to your finding in part (a)? Note: the earth is estimated to be 4.5 Gy old.