Chem 155 Homework #3 Due Mon Jan 23 at the start of class

Reading: All of Chapter 17, Begin 18

Textbook Problems:

17.2
17.6
17.13
17.20
17.26
17.29
17.37
17.42
17.45
17.47
17.57
17.60

Additional Problems:
1) Use a calculation to estimate the mass of coal that must be burned to charge a 3.7 V 1500 mAh iPhone battery assuming the electricity is generated from a coal-fired power plant. You'll need to look up (or make reasonable estimates) of the other numbers needed in this problem. To get a more accurate answer should probably consider the efficiency of the power plant at converting heat into electricity, the efficiency of electrical transmission from the plant to your home, and the efficiency of the phone charger at converting AC back to DC to charge your iPhone, (and the fraction of energy delivered to the battery that is stored). You should either look up, or make chemically and physically informed estimates for each value, for instance, you can either assume coal is 100% carbon (although it actually varies from 30-98% C by weight) and use thermochemical data from earlier chapters in Oxtoby, or look up the energy density of coal (both should give you about the same answer). Likewise you could use an estimate of the efficiency of a heat engine to compute the power plant efficiency, or use google to look up the efficiency of a coal plant (they vary depending on type and age).