

## Homework 13 Kinetics

From the Oxyby text:

1, 3, 5, 7, 13, 17, 21, 35, 39, 53, 67  
more interesting  
25, 27, 47

A couple of others to play with:

1. A clay pot is found at an archeological dig. Using mass spectrometry and a piece of straw found in the clay, the  $^{14}\text{C}$  concentration is found to be 0.233% of the base amount expected at the time the straw was added to the clay.
  - a) How old is the pot?
  - b) If the uncertainty of the quantitative data found in the mass spectral data were + .0023%, what is an estimate of uncertainty in the age you calculated?
2. Below is the concentration data for a reactant species in a particular reaction as the reaction proceeds.

t (s)	conc (M)
0	1.34E-03
0.4	7.18E-04
0.8	3.85E-04
1.2	2.06E-04
1.6	1.10E-04
2	5.92E-05
2.4	3.17E-05

- a) Estimate the initial rate of reaction from the data.
- b) Is this value constant as the reaction proceeds, i.e., at different times?
- c) What is the order of the reaction?
- d) What would you plot versus time to obtain a linear relationship?
- e) What is the rate constant?
- f) What is the true initial rate of reaction at  $t = 0$ ?