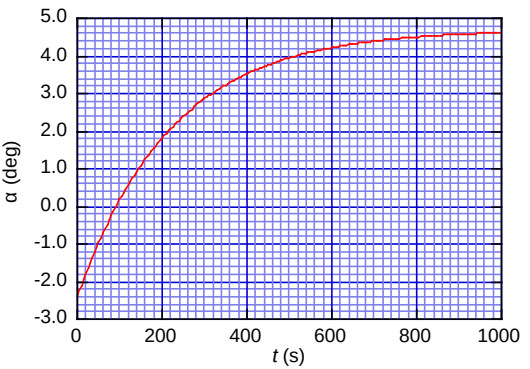
Chemistry 236 -- Quiz 4 Lab Day ____

September 26, 2007 — Inversion of Sucrose

Pledge and signature:

Note: If you want your paper returned folded (*i.e.*, score concealed), please print your name on the back.

1. (10) The figure to the right represents optical rotation data for a hypothetical sugar we shall call *pickanose*. From this figure, give approximate values for the following quantities: (1) α_0, (2) α_∞, (3) the inversion time (in s), (4) the half-life of pickanose, and (5) the effective rate constant k_{eff}.



(1) –2.3°

(2) 4.7°

(3) 90 s

(4) 155 s

(5) 0.0045 s^{-1}

2. (3) An acid-calalyzed reaction has a rate constant of 0.0234 L mol^{-1} min^{-1}. A reaction is initiated by mixing 10.00 mL of 6.0 M HCl with 20.0 mL of a solution of the other reactant. Assuming that volumes are additive, calculate the effective rate constant for this mixture.

$k\,[H^+] = 0.0468\ min^{-1}$

3. (3) A solution is prepared by dissolving 13.71 g of smactose in water and bringing the volume to 0.100 L in a volumetric flask. The optical rotation observed at λ_D for this solution in a 0.200-m polarimetry cell is –24.7°. Calculate the specific rotation of smactose (units deg mL g^{-1} dm^{-1}) at this wavelength and T.

–90.1 deg mL g^{-1} dm^{-1}