CE421/521 Environmental Biotechnology

Homework Assignment

Michaelis-Menten Kinetics

due September 8, 2005

1. Using linear regression and the Lineaweaver-Burke linearization determine the best fit Michaelis-Menten kinetic parameters (v_m and K_m) for the following experimental data.

S, mol/L	v, mol/L·min
0.01	0.00064
0.008	0.00058
0.006	0.000479
0.004	0.00038
0.002	0.000219

2. Using a spreadsheet such as Excel (or other computer program) determine the best fit kinetic parameters for the above data set. Minimize the sum of squared error (SSE) between the raw data points and the predicted data points. Use Solver to minimize the SSE by adjusting the v_m and K_m values.

3. Repeat the above steps for the modified data set (both linearization and Solver):

S, mol/L	v, mol/L·min
0.009	0.00065
0.0081	0.00057
0.0059	0.00048
0.0042	0.00037
0.0018	0.00022

4. Based on the results above, what can you say about the use of linearization methods to analyze data from a non-linear model?