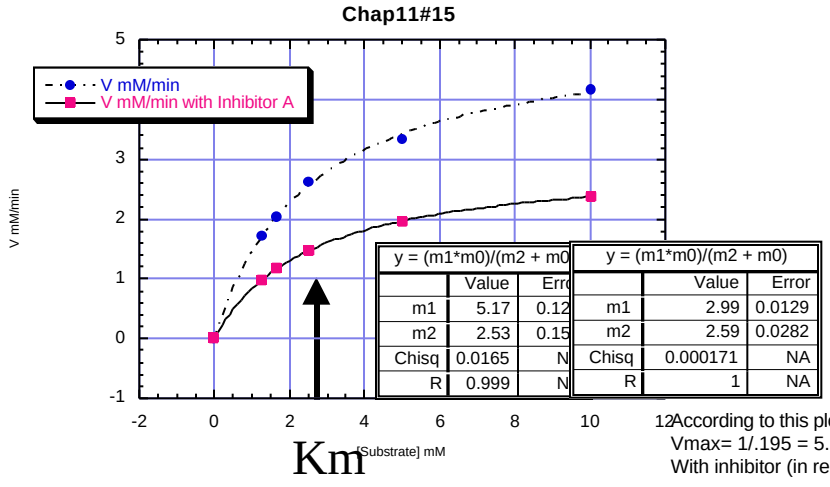
Chap. 11 #13
A) [Substrate] = 0.5 mM and Enzyme is in excess.
(see page 378). The rate is proportional to kcat/Km
Since [S] << Km (not by that much)
Substrate ……G kcat/Km = 26/4= 6.5 / s mM
……A kcat/Km = 37/1.5 = 24.6 /s mM
……F kcat/Km = 18/.64= 28.1 / s mM
The F substrate is the fastest and G the slowest.

B)Hydrophobic residues seems to be required after the cleavage
Site (R2) and A before it (R1)

C) His definitely, probably Ser, and possibly Glu or Asp.

Using KaleidaGraph, the data were fit to V = Vmax*S/ (Km + S) where Vmax= m1, [S]=m0, and Km= m2.
With no inhibitor (in blue) Vmax = 5.17 mmol/min and Km= 2.53 mM. With Inhibitor Vmax = 2.99 mmol/min and Km 2.59 mM.

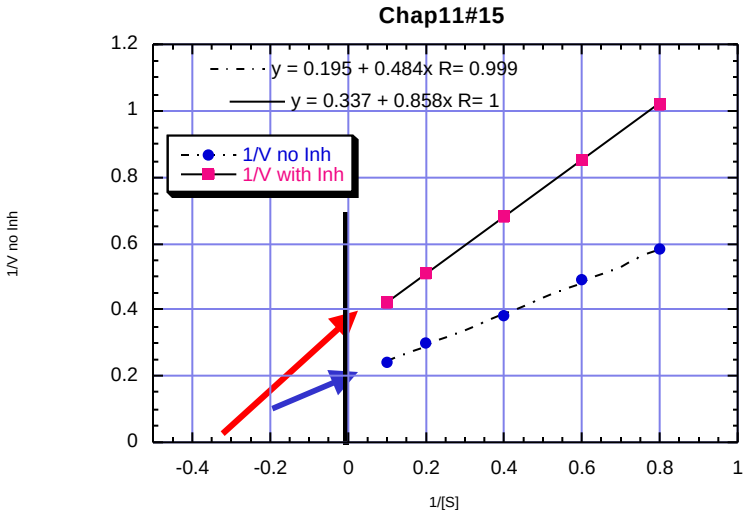


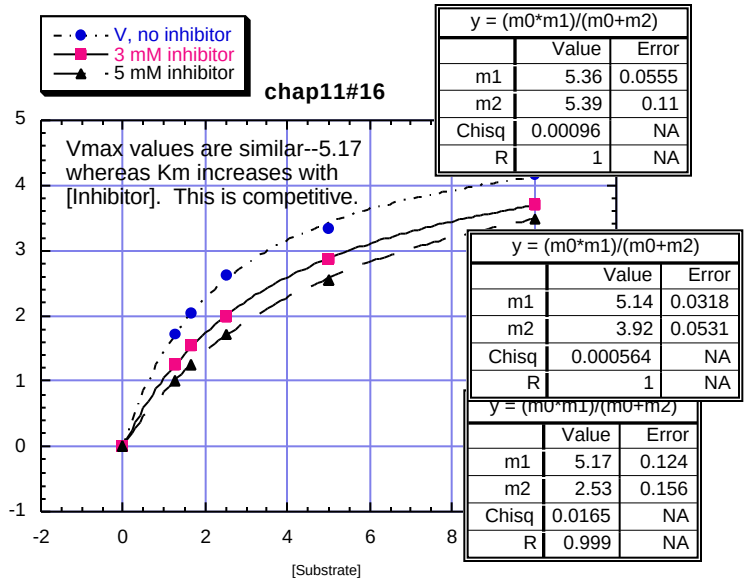
Km

Chap. 11 #15
This is a non-competitive Inhibitor. Km is 2.5 mM, Vmax with no Inhibitor 5.1 mmol/min.
Vmax with inhibitor is about 3.0 mmol/min.

According to this plot, with no inhibitor (in blue)
Vmax= 1/.195 = 5.1 mmol/min and1/ Km = .195/.484= .402 so Km = 2.48 mM.
With inhibitor (in red) Vmax = 1/.337= 2.97 mmol/min and Km = .858/.337 = 2.54 mM.

Which graph is better?
The hyperbolic graph shows non-competitve Inhibition, but the plateau (Vmax) is hard to estimate.
The double Lineweaver-Burk Plot is better for Vmax. Knowing Vmax, either graph can be used For Km.





y = (m0*m1)/(m0+m2)		
	Value	Error
m1	5.36	0.0555
m2	5.39	0.11
Chisq	0.00096	NA
R	1	NA

y = (m0*m1)/(m0+m2)		
	Value	Error
m1	5.14	0.0318
m2	3.92	0.0531
Chisq	0.000564	NA
R	1	NA

y = (m0*m1)/(m0+m2)		
	Value	Error
m1	5.17	0.124
m2	2.53	0.156
Chisq	0.0165	NA
R	0.999	NA

Chap. 11 #16
Competitive Inhibitor
Vmax is always 5 mmol/min
Km apparent is 2.5 mM
With no inhibitor and
3.8 mM at 3 mM Inh.
At 5 mM inhibitor I find
About 5.2 mM, but the text
Finds about 4 mM. K I is
4.2 mM and a 3rd graph is needed.