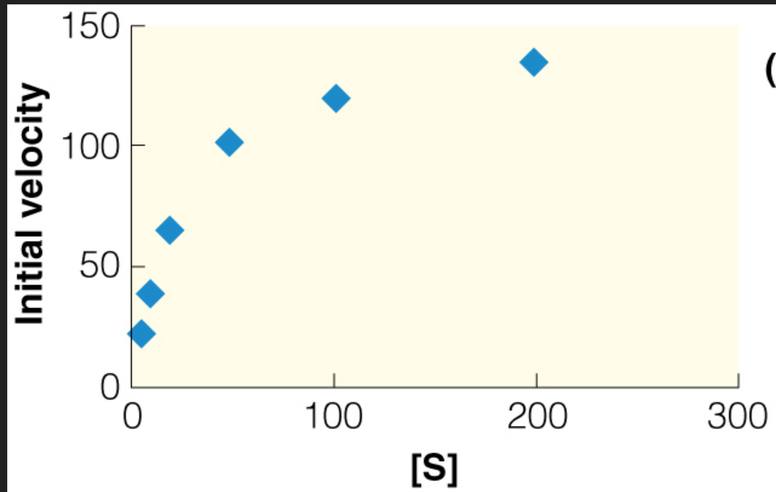
TESTING THE MODEL

- Various reactions are performed at known Enzyme and Substrate concentrations.
- The initial rates of the reactions are plotted against the substrate concentrations
- If the graph is hyperbolic, then it can be assumed the enzyme obeys the Michaelis-Menten model.
  - We can calculate K_M and V_{max}



(b) Initial rate data, determined as described in (a), are plotted as a function of the substrate concentration. The enzyme appears to obey the Michaelis–Menten kinetic model (compare this plot to Figure 8.21).

CALCULATING K_M AND V_{MAX}

- V_{max} is inherently hard to calculate or measure because the graph of enzyme velocities is hyperbolic.
  - Velocity asymptotically approaches its maximum
  - Even at 10-20 times the K_M we are only reaching 90-95% of the maximum
- To solve this issue, Hans Lineweaver and Dean Burk rearranged the Michailis-Menten equation into a linear function (y = mx + b), and then took the reciprocal.

$$\frac{1}{v} = \left(\frac{K_M}{V_{max}}\right) * \frac{1}{[S]} + \frac{1}{V_{max}}$$

y = m x + b

- This double reciprocal plot is called the Lineweaver-Burk Plot
  - It can be used to approximate both K_M and V_{max}