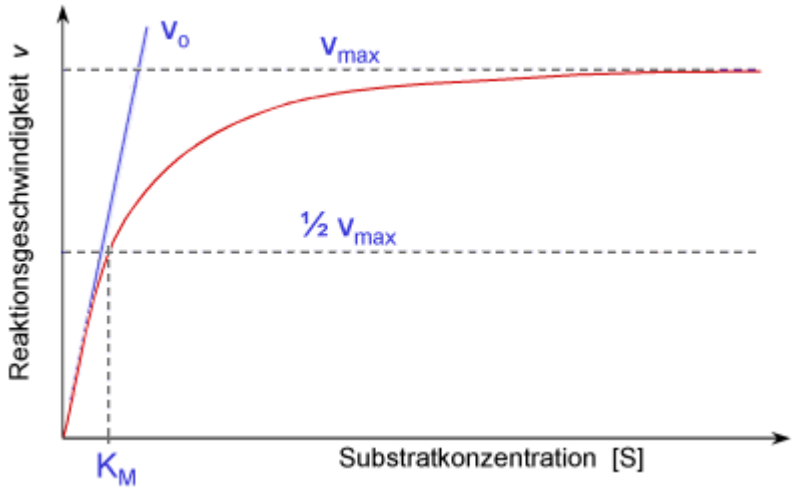
The Michaelis-Menten equation is the basic equation in enzyme kinetics. The graph shows a hyperbola. The tendency of the relative speed for large substrate concentrations is towards 1 as the speed v tends towards v_{max} .



Rate of reaction (Michaelis-Menten kinetics):

$$\frac{\Delta S}{\Delta t} = \frac{(K_m \cdot x) \cdot S}{S_m + S} \qquad \text{(Gl. 1)}$$

$\frac{\Delta S}{\Delta t}$	Rate of reaction	[mg/(l·h)]
$K_m \cdot x$	max. rate of reaction	[mg/(l·h)]
S	Substrate concentration at point of reaction	[mg/l]
S_m	substrate concentration at $\frac{K_m \cdot x}{2}$	[mg/l]
x	constans	[-]

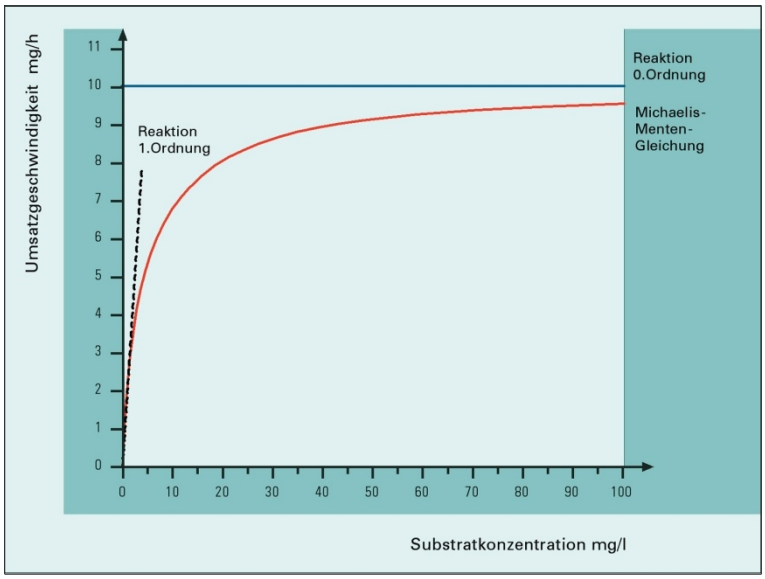
Reaction 0. Order (high substrate concentration (5 · S_m):

$$\frac{\Delta S}{\Delta t} = K_m \cdot x \qquad \text{(Gl. 2)}$$

$\frac{\Delta S}{\Delta t}$	Rate of reaction	[mg/(l·h)]
$K_m * x$	max. rate of reaction	[mg/(l·h)]

Reaction 1. Order (low substrate concentration (S_m + S = S_m):

$$\frac{\Delta S}{\Delta t} = \frac{(K_m \cdot x) \cdot S}{S_m} \qquad \text{(Gl. 3)}$$



$\frac{\Delta t}{\Delta S \frac{i}{i}}$	rate of reaction	[mg/(l·h)]
$K_m \cdot x$	max. rate of reaction	[mg/(l·h)]
S	substrate concentration at point of reaction	[mg/l]
S_m	substrate concentration at $\frac{K_m \cdot x}{2}$	[mg/l]

Michaelis-Menten constant:

$$K_m = \frac{|E| \cdot |S|}{|ES|} \qquad \text{(Gl. 4)}$$

K_m	Michaelis-Menten constant, substrate concentration at half the maximum rate of reaction or dissociations constant of the ES complex	[mg/l]
E	Enzyme concentration	[mg/l]
S	Substrate concentration	[mg/l]
ES	concentration of the enzyme-substrate complex	[mg/l]

Rate of reduction

Michaelis-Menten relation:

$$V_0 = \frac{d_s}{d_t} = V_{ges} * \frac{(S)}{K_M + (S)} \qquad \text{(Gl. 5)}$$

V_0	rate of reaction (i.e. rate of reduction)	[m/s]
(S)	substrate concentration (=foreign matter)	[mg/l]
K_M	Michaelis-Menten constant (obtained from the substrate concentration at half the maximum reaction rate	[mg/l]
V_{max}	maximum rate of reaction	[m/s]