Lineweaver–Burk Fit of Michaelis–Menten Data

Fits Vmax and Km from three to five substrate–rate pairs by linear regression of 1/v on 1/S (Lineweaver–Burk), with the coefficient of determination.

Method: Lineweaver–Burk linearisation

Input parameters

Unit system: SI

Parameter	Value	Unit
Number of data points	5.0000	
Substrate 1	0.50000	mmol/L
Rate 1 (any consistent unit)	0.82000	
Substrate 2	1.0000	mmol/L
Rate 2	1.3300	
Substrate 3	2.0000	mmol/L
Rate 3	1.9800	
Substrate 4	5.0000	mmol/L
Rate 4	2.6800	
Substrate 5	10.000	mmol/L
Rate 5	3.0500	

Calculated results

Parameter	Value	Unit
Maximum rate	3.6029	
Michaelis constant	1.6969	mmol/L
Coefficient of determination of the linear fit	0.99984	

Notes for this case

• 1/v = (K_m/V_max)(1/S) + 1/V_max. The double-reciprocal plot overweights low-substrate points, where errors are largest; nonlinear least squares on v(S) gives better estimates. Competitive inhibition raises the slope only; non-competitive raises the intercept.

Formula and method

$$\frac{1}{v} = \frac{K_m}{V_{max}}\frac{1}{S} + \frac{1}{V_{max}}$$

Variables

n	Number of data points	-
S_1	Substrate 1	mol/m³
v_1	Rate 1 (any consistent unit)	-
S_2	Substrate 2	mol/m³
v_2	Rate 2	-
S_3	Substrate 3	mol/m³
v_3	Rate 3	-
S_4	Substrate 4	mol/m³
v_4	Rate 4	-

S_5	Substrate 5	mol/m³
v_5	Rate 5	-
V_{max}	Maximum rate	-
K_m	Michaelis constant	mol/m³
R^2	Coefficient of determination of the linear fit	-

Method and standards

Double-reciprocal fit.

Assumptions and limits

- Michaelis–Menten form; initial rates.

References

Lineweaver–Burk linearisation

Report details

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Release checks	3 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

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