


Enzyme	$k_{\text{cat}}/K_M$ ( $\text{s}^{-1}\text{M}^{-1}$ )
Acetylcholinesterase	$1.6 \times 10^8$
Carbonic anhydrase	$8.3 \times 10^7$
Catalase	$4 \times 10^7$
Crotonase	$2.8 \times 10^8$
Fumarase	$1.6 \times 10^8$
Triose phosphate isomerase	$2.4 \times 10^8$
$\beta$ -Lactamase	$1 \times 10^8$
Superoxide dismutase	$7 \times 10^9$

$$k_{cat} = k_2$$

Table 8.7 Substrate preferences of chymotrypsin

Amino acid in ester	Amino acid side chain	$k_{cat}/K_M$ ( $s^{-1} M^{-1}$ )
Glycine	—H	$1.3 \times 10^{-1}$
Valine	$\begin{array}{c} \text{CH}_3 \\   \\ \text{—CH} \\   \\ \text{CH}_3 \end{array}$	2.0
Norvaline	—CH <sub>2</sub> CH <sub>2</sub> CH <sub>3</sub>	$3.6 \times 10^2$
Norleucine	—CH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> CH <sub>3</sub>	$3.0 \times 10^3$
Phenylalanine	—CH <sub>2</sub> — 	$1.0 \times 10^5$

**Table 8.6 Maximum turnover numbers of some enzymes**

<b>Enzyme</b>	<b>Turnover number (per second)</b>
Carbonic anhydrase	600,000
3-Ketosteroid isomerase	280,000
Acetylcholinesterase	25,000
Penicillinase	2,000
Lactate dehydrogenase	1,000
Chymotrypsin	100
<u>DNA</u> polymerase I	15
Tryptophan synthetase	2
Lysozyme	0.5

=  $k_2$

**Table 8.5  $K_M$  values of some enzymes**

Enzyme	Substrate	$K_M(\mu\text{M})$
Chymotrypsin	Acetyl-L-tryptophanamide	5000
Lysozyme	Hexa-N-acetylglucosamine	6
$\beta$ -Galactosidase	Lactose	4000
Threonine deaminase	Threonine	5000
Carbonic anhydrase	$\text{CO}_2$	8000
Penicillinase	Benzylpenicillin	50
Pyruvate carboxylase	Pyruvate	400
	$\text{HCO}_3^-$	1000
	<u>ATP</u>	60
Arginine-tRNA synthetase	Arginine	3
	tRNA	0.4
	ATP	300