

Table S2: Q₁₀ values for the identified pairs of non-enzymatic and enzyme-catalyzed reactions

Thermophilic enzyme	Organism	Q ₁₀ ^{enz}	R ² ^a	Q ₁₀ ^{non}	H [‡] _{non} [kcal/mol]	Low temperature (T ₁)			High temperature (T ₂)			L ₁₀ ^d	references
						[°C]	k _{cat} [s ⁻¹] ^b	k _{cat} /k _{non}	[°C]	k _{cat} [s ⁻¹] ^b	k _{cat} /k _{non}		
Chorismate mutase (CM)	<i>Methanococcus jannaschii</i>	2.25	0.991	3.02	20.71	10	0.87	1.4×10 ⁶	70	113	2.1×10 ⁵	1.39	[14],[15]
β-glucosidase (CeIB*)	<i>Pyrococcus furiosus</i>	1.99	0.999 ^f	4.20	29.7	20	13	6×10 ¹⁵	90	1600	5.3×10 ¹²	2.96	[16],[17]
Carboxylesterase	<i>Bacillus acidocaldarius</i>	1.18	0.905 ^e	2.37	17.1	37	145	9.7×10 ⁶	60	213	1.9×10 ⁶	2.01	[18],[19]
Acylphosphatase	<i>Sulfolobus solfataricus</i>	1.47	0.972	3.92	25	15	107	5.7×10 ⁷	55	498	8.3×10 ⁵	2.56	[20],[21]
Prephenate Dehydratase (PDT)	<i>Methanocaldococcus jannaschii</i>	2.33	0.959	2.41	17	20	5.23	4.5×10 ⁶	70	191	3.2×10 ⁶	1.06	[22]
Orotidine 5'-Monophosphate decarboxylase	<i>Methanothermobacter thermoautotrophicus</i>	2.33	0.996	3.90 (or 12 ⁱ)	44.4	5	0.64 ^c	5.3×10 ¹⁶	55	44 ^c	2.8×10 ¹⁴	3.70	[23-25]
Cytidine deaminase (CDABcald)	<i>Bacillus caldolyticus</i>	1.62 ^a	0.978 ^f	3.46	22.1	6	9.87 ^g	N/A	54	100 ^g	N/A	N/A	[26],[27]
α-Glucosidase	<i>Pyrococcus furiosus</i>	2.10 ^a	0.999 ^f	3.55	30.3	50	1.7 ^g	N/A	105	100 ^g	N/A	N/A	[28],[17]
Carboxypeptidase 1(TNA1_CP)	<i>Thermococcus sp. NA1</i>	1.82 ^a	0.946 ^f	3.42	22.9	30	9.2 ^g	N/A	70	100 ^g	N/A	N/A	[29-31]
Average (SD)		1.89 (0.41)		3.36 (0.65)								2.28 (1)	
Mesophilic enzyme	Organism	Q ₁₀ ^{enz}	R ² ^a	Q ₁₀ ^{non}	H [‡] _{non} [kcal/mol]	Low temperature (T ₁)			High temperature (T ₂)			L ₁₀ ^d	references
						[°C]	k _{cat} [s ⁻¹] ^b	k _{cat} /k _{non}	[°C]	k _{cat} [s ⁻¹] ^b	k _{cat} /k _{non}		
Cytidine deaminase	<i>Escherichia coli</i>	1.53	0.992	3.46	22.1	7	2.5	4.5×10 ¹¹	35	15.9	9.3×10 ⁹	4.07	[27]
Orotidine 5'-Monophosphate decarboxylase	<i>Escherichia coli</i>	1.93	0.986	3.90 (or 12 ⁱ)	44.4	5	2.5 ^c	7.7×10 ¹⁷	45	35 ^c	1.5×10 ¹⁵	4.77	[23-25]
Orotidine 5'-Monophosphate decarboxylase	<i>Saccharomyces cerevisiae</i>	1.92	0.996	3.90 (or 12 ⁱ)	44.4	5	3.1 ^c	9.5×10 ¹⁷	50	59 ^c	9.6×10 ¹⁴	4.64	[23-25]
Average (SD)		1.79 (0.40)		3.75 (0.25)								4.49 (0.37)	

^a - R² is the coefficient of determination of k_{cat} versus temperature data fitted to exponential Arrhenius equation

^b - k_{cat} values were extrapolated from graphs

^c - k_{cat} values published as numerical values

^d - Loss of rate enhancement per 10°C. L₁₀ was calculated with equation (3) and k_{cat}/k_{non} values.

^e - fitted with data at three different temperatures only.

^f - fitted with relative activity *versus* temperature data

^g - Relative activity based Q₁₀. k_{cat}/k_{non} and L₁₀ cannot be calculated.

ⁱ - The Q₁₀ extracted from ref. 24 is 3.9, the value extracted from ref. 25 is ~12.

N/A: not applicable

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