Table 17-1. Particles that are Stable or Decay either Weakly or Electromagnetically

Generic Name	Particle Symbol	Rest Mass (MeV/c^2)	Lifetime (sec)	Charge Q	Intrinsic Spin s	Lepton Number L_e, L_μ, or L_τ	Baryon Number B	Intrinsic Parity P	Isospin T	Isospin z component T_z	Strangeness S
Photon	γ	0	stable	0	1	0	0	Odd	0, 1	0	0
Leptons	ν_e	0	stable	0	1/2	+1	0				
	ν_μ	0	stable	0	1/2	+1	0				
	ν_τ	0	stable	0	1/2	+1	0				
	e^-	0.511	stable	−1	1/2	+1	0				
	μ^-	105.7	2.2×10^{-6}	−1	1/2	+1	0				
	τ^-	1784	5×10^{-13}	−1	1/2	+1	0				
Mesons	π^+	139.6	2.6×10^{-8}	+1	0	0	0	Odd	1	+1	0
	π^0	135.0	8×10^{-17}	0	0	0	0	Odd	1	0	0
	π^-	139.6	2.6×10^{-8}	−1	0	0	0	Odd	1	−1	0
	K^+	493.8	1.2×10^{-8}	+1	0	0	0	Odd	1/2	+1/2	+1
	K^0	497.8	$\begin{pmatrix} 8.9 \times 10^{-11} \\ \text{and} \\ 5.2 \times 10^{-8} \end{pmatrix}$	0	0	0	0	Odd	1/2	−1/2	+1
	$\overline{K^0}$	497.8		0	0	0	0	Odd	1/2	+1/2	−1
	K^-	493.8	1.2×10^{-8}	−1	0	0	0	Odd	1/2	−1/2	−1
	η^0	549	8×10^{-19}	0	0	0	0	Odd	0	0	0
	η'	958	2×10^{-21}	0	0	0	0	Odd	0	0	0
Baryons	p	938.3	stable	+1	1/2	0	+1	Even	1/2	+1/2	0
	n	939.6	925	0	1/2	0	+1	Even	1/2	−1/2	0
	Λ^0	1116	2.6×10^{-10}	0	1/2	0	+1	Even	0	0	−1
	Σ^+	1189	8.0×10^{-11}	+1	1/2	0	+1	Even	1	+1	−1
	Σ^0	1192	6×10^{-20}	0	1/2	0	+1	Even	1	0	−1
	Σ^-	1197	1.5×10^{-10}	−1	1/2	0	+1	Even	1	−1	−1
	Ξ^0	1315	2.9×10^{-10}	0	1/2	0	+1	Even	1/2	+1/2	−2
	Ξ^-	1321	1.6×10^{-10}	−1	1/2	0	+1	Even	1/2	−1/2	−2
	Ω^-	1672	8.2×10^{-11}	−1	3/2	0	+1	Even	0	0	−3

Quantity Conserved	Strong	Electro-magnetic	Weak
Energy	yes	yes	yes
Linear momentum	yes	yes	yes
Angular momentum	yes	yes	yes
Charge	yes	yes	yes
Electronic lepton number	yes	yes	yes
Muonic lepton number	yes	yes	yes
Tauonic lepton number	yes	yes	yes
Baryon number	yes	yes	yes
Isospin magnitude	yes	no	no ($\Delta T = 1/2$ for nonleptonic)
Isospin z component	yes	yes	no ($\Delta T_z = 1/2$ for nonleptonic)
Strangeness	yes	yes	no ($\Delta S = 1$)
Parity	yes	yes	no
Charge conjugation	yes	yes	no
Time reversal (or CP)	yes	yes	yes (But 10^{-3} violation in K^0 decay)

Table 18-1 Quark Quantum Numbers, Utilizing $Q = T_z + (B + S + \mathscr{C} + \mathscr{B} + \mathscr{T})/2$

Quantum Number	Quark Flavor d	u	s	c	b	t
Charge, Q (in units of e)	−1/3	+2/3	−1/3	+2/3	−1/3	+2/3
Isospin, T	1/2	1/2	0	0	0	0
Isospin z component, T_z	−1/2	+1/2	0	0	0	0
Baryon number, B	1/3	1/3	1/3	1/3	1/3	1/3
Strangeness, S	0	0	−1	0	0	0
Charm, $\mathscr{C}$	0	0	0	+1	0	0
Bottom (beauty), $\mathscr{B}$	0	0	0	0	−1	0
Top (truth), $\mathscr{T}$	0	0	0	0	0	+1