Summary of "stable"(lifetime $\gg 10^{-23}$s) particle properties

Tailored to analysis of bubble chamber physics - not complete.

Particle symbol	Quarks	Particle name	Mass [MeV/c^2]	Main decay(s)	Decay probability	Mean life [s]	$c \cdot \tau$ [cm]	Comment
γ		gamma	0	$e^- + e^+$		stable		Strictly not a decay, but a "materialisation"in the field of a nucleus.
ν		neutrino	≈ 0			stable		Neutrinos show up in final states as unseen partners in decays; eg. of μ and π.
e^-		electron	0.511			stable		Curls up characteristically in a bubble chamber.
e^+		positron	0.511			stable		Annihilates with electron. Also curls up characteristically in a bubble chamber.
μ^-		mu minus	105.7	$e^- + \overline{\nu}_e + \nu_\mu$	100	$2.2 \cdot 10^{-6}$	$\approx 10^5$	Usually escapes; sometimes kinks
μ^+		mu plus	105.7	$e^+ + \nu_e + \overline{\nu}_\mu$	100	$2.2 \cdot 10^{-6}$	$\approx 10^5$	Usually escapes; sometimes kinks
π^-	$d\overline{u}$	pi minus	139.57	$\mu^- + \overline{\nu}_\mu$	100	$2.6 \cdot 10^{-8}$	780	May kink or "pimue".
π^+	$u\overline{d}$	pi plus	139.57	$\mu^+ + \nu_\mu$	100	$2.6 \cdot 10^{-8}$	780	May kink or "pimue".
π^0	$\frac{u\overline{u}+d\overline{d}}{\sqrt{2}}$	pi zero	135.0	$\gamma + \gamma$	98.80	$8.4 \cdot 10^{-17}$		May give e^+e^- pair(s).
				$\gamma + e^- + e^+$	1.20			When e^+e^- come directly from interaction, it is called a Dalitz pair.
$K^\pm$	$u\overline{s}$, $s\overline{u}$	kaon	493.7	$\mu + \nu_\mu$	63.51	$1.2 \cdot 10^{-8}$	371	May kink.
				$\pi^\pm + \pi^0$	21.16			May kink.
				$\pi^\pm + \pi^+ + \pi^-$	5.59			May give "trident".
K^0	$d\overline{s}$	kay zero	497.0	$\pi^+ + \pi^-$	68.61	$0.9 \cdot 10^{-10}$	2.68	This is also called K^0_S; may give vee.
p	uud	proton	938.27			stable		Low energy p often stops in bubble chamber - characteristic dark track.
n	ddu	neutron	939.6	$p + e^- + \overline{\nu}_e$	100	887		Sometimes identified via a proton it collides with.
Λ	uds	lambda	1116	$p + \pi^-$	63.9	$2.6 \cdot 10^{-10}$	7.89	May give vee.
Σ^-	dds	sigma minus	1197	$n + \pi^-$	99.85	$1.5 \cdot 10^{-10}$	4.4	May kink.
Σ^+	uus	sigma plus	1189	$p + \pi^0$	52.0	$0.8 \cdot 10^{-10}$	2.4	May kink.
				$n + \pi^+$	48.0			May kink.
Σ^0	uds	sigma zero	1193	$\Lambda + \gamma$	100			May give Λ and γ.
Ξ^-	dss	xi minus	1321	$\Lambda + \pi^-$	100	$1.6 \cdot 10^{-10}$	4.9	Λ from kink possible.
Ξ^0	uss	xi zero	1315	$\Lambda + \pi^0$	99.5	$2.9 \cdot 10^{-10}$	8.7	$\Lambda + \gamma$s to downstream point.
Ω^-	sss	omega minus	1672	$\Lambda + K^-$	67.8	$0.8 \cdot 10^{-10}$	2.5	Λ from kink possible.
				$\Xi^0 + \pi^-$	23.6			$\Lambda + \gamma$s to downstream point.
				$\Xi^- + \pi^0$	8.6			Λ to 2^{nd} kink possible.

- The antiparticles have not been included in the table in some cases, but they have the same decay characteristics. The only difference is that all decay products are the antiparticles of those listed in the table.
- In cases where the $\pm$ version of the particle has been written in one line, the appropriate decay products should be chosen with charge conservation in mind.