

Griffiths.

4.24. From the diagrams, we determine the multiplicity of the particles:

$$\Omega^-: N=1 \Rightarrow I=0, I_3=0$$

$$\Sigma^+: N=3 \Rightarrow I=1, I_3=1$$

$$\Xi^0: N=2 \Rightarrow I=1/2, I_3=1/2$$

$$\rho^+: N=3 \Rightarrow I=1, I_3=1$$

$$\eta: N=2 \Rightarrow I=1/2, I_3=0$$

$$\bar{K}^0: N=2 \Rightarrow I=1/2, I_3=1/2$$

~~$$I_3 = \frac{1}{2}(A+S) = Q$$~~

$$\Omega^- = sss, \text{ baryon}, Q = -1 \Rightarrow \cancel{Q = I_3 = 0}$$

$$\Sigma^+ = uus, \text{ baryon}, Q = +1 \Rightarrow \cancel{I_3 = 1}$$

$$\Xi^0 = uss, \text{ baryon}, Q = 0 \Rightarrow \cancel{I_3 = 0}$$

$$\rho^+ = u\bar{d}, \text{ meson}, Q = +1$$

$$\bar{K}^0 = s\bar{d}, \text{ meson}, Q = 0$$

$$\eta = \frac{1}{\sqrt{6}}(u\bar{u} + d\bar{d} - 2s\bar{s}), \text{ meson}, Q = 0.$$

$$I_3 = Q - \frac{1}{2}(A+S) \Rightarrow \Omega^- = |00\rangle. \text{ } \cancel{s} \text{ has } S = -1!$$

$$\Rightarrow \left. \begin{array}{l} \Omega^- = |00\rangle \\ \Sigma^+ = |11\rangle \\ \Xi^0 = |1/2, 1/2\rangle \\ \rho^+ = |11\rangle \\ \eta = |1/2, 1/2\rangle \\ \bar{K}^0 = |1/2, 1/2\rangle \end{array} \right\} \in ?$$