Considering only the reactions of the PPI chain, the differential equations that govern the number densities of the nuclei involved are

$$\begin{aligned}
\frac{dn_H}{dt} &= -2\lambda_{pp}\frac{(n_H)^2}{2} - \lambda_{pd}\, n_H n_D + 2\lambda_{33}\frac{(n_3)^2}{2}, \\
\frac{dn_D}{dt} &= \lambda_{pp}\frac{(n_H)^2}{2} - \lambda_{pd}\, n_H n_D, \\
\frac{dn_3}{dt} &= \lambda_{pd}\, n_H n_D - 2\lambda_{33}\frac{(n_3)^2}{2}, \\
\frac{dn_4}{dt} &= \lambda_{33}\frac{(n_3)^2}{2},
\end{aligned}$$

where n_H, n_D, n_3, n_4 are the number densities of H, D, ^{3}He and ^{4}He, respectively, and λ_{pp}, etc. denote the appropriate two-particle reaction rates (i.e. $\langle \sigma v \rangle$). Explain the origin of each term in the first of these equations.