Consider the coalescence of two particles with wave functions $\phi_1(x)$ and $\phi_2(x)$ to a bound state with wave function $\Phi(x)$.

If the two particles are non-identical, then the initial and final states are

$$
\begin{aligned}
\langle x_1, x_2|i\rangle &= \phi_1(x_1)\phi_2(x_2), \\
\langle x_1, x_2|f\rangle &= \frac{1}{\sqrt{V}}e^{iK(x_1+x_2)}\Phi(x_1 - x_2).
\end{aligned}
$$

Their coalescence probability $P = |\langle f|i\rangle|^2$ is then

$$
\begin{aligned}
P &= \left|\frac{1}{\sqrt{V}}\int dx_1 \int dx_2 e^{-iK(x_1+x_2)}\Phi(x_1 - x_2)\phi_1(x_1)\phi_2(x_2)\right|^2 \\
&= \int dK \int dx_1 dk_1 dx_2 dk_2 W_1(x_1, k_1)W_2(x_2, k_2)W(x_1 - x_2, (k_1 - k_2)/2) \\
&\quad \times\delta(K - k_1 - k_2),
\end{aligned}
$$

where the Wigner function is defined as

$$
W(x, k) = \int dy \phi^*(x + y/2)\phi(x - y/2)e^{-iky}.
$$

If the two particles are identical, then the initial state is

$$
\langle x_1, x_2|i\rangle = \frac{1}{\sqrt{2}}[\phi_1(x_1)\phi_2(x_2) \pm \phi_2(x_1)\phi_1(x_2)].
$$

Then

$$
\begin{aligned}
\langle f|i\rangle &= \frac{1}{\sqrt{2V}}\int dx_1 \int dx_2 e^{-iK(x_1+x_2)}\Phi(x_1 - x_2)[\phi_1(x_1)\phi_2(x_2) \pm \phi_2(x_1)\phi_1(x_2)] \\
&= \sqrt{\frac{2}{V}}\int dx_1 \int dx_2 e^{-iK(x_1+x_2)}\Phi(x_1 - x_2)\phi_1(x_1)\phi_2(x_2),
\end{aligned}
$$

where the second line is obtained by interchange x_1 and x_2 and assuming $\Phi(x)$ is an even (odd) function if the total wave function of the two identical particles is symmetric (anti-symmetric). Hence the coalescence probability of two identical particles is twice that for non-identical particles. **The coalescence of identical particles can thus be treated as non-identical particles.** The same consideration applies to the coalescence of identical particles to form bound state of more than two particles.