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## 3.2 Changing the Notation.

Write state as $|n_1 n_2 n_3 \cdots\rangle$ where

$n_i$ is num of particles w/ $p_i$.

Ex $|p_1 p_2 p_1\rangle \Rightarrow |2|0\,0\cdots\rangle$

This is called the occupational number representation.

$$\hat{H}|n_1 n_2 \cdots\rangle = \left[\sum_m n_{pm} E_{pm}\right]|n_1 n_2 \cdots\rangle$$

$E_n = (n+\frac{1}{2})\hbar\omega \rightarrow E_n = n\hbar\omega$.

many particles $\Rightarrow E = \sum_k n_k \hbar\omega_k$

| SHO | Identical Particles |
|---|---|
| Quanta in Oscillators | $\rightarrow$ Particles in momentum states |
| $k^{th}$ Oscillator | $\rightarrow m^{th}$ momentum mode $p_m$ |
| $E = \sum_k n_k \hbar\omega_k$ | $\rightarrow E = \sum_m E_{pm} n_{pm}$. |