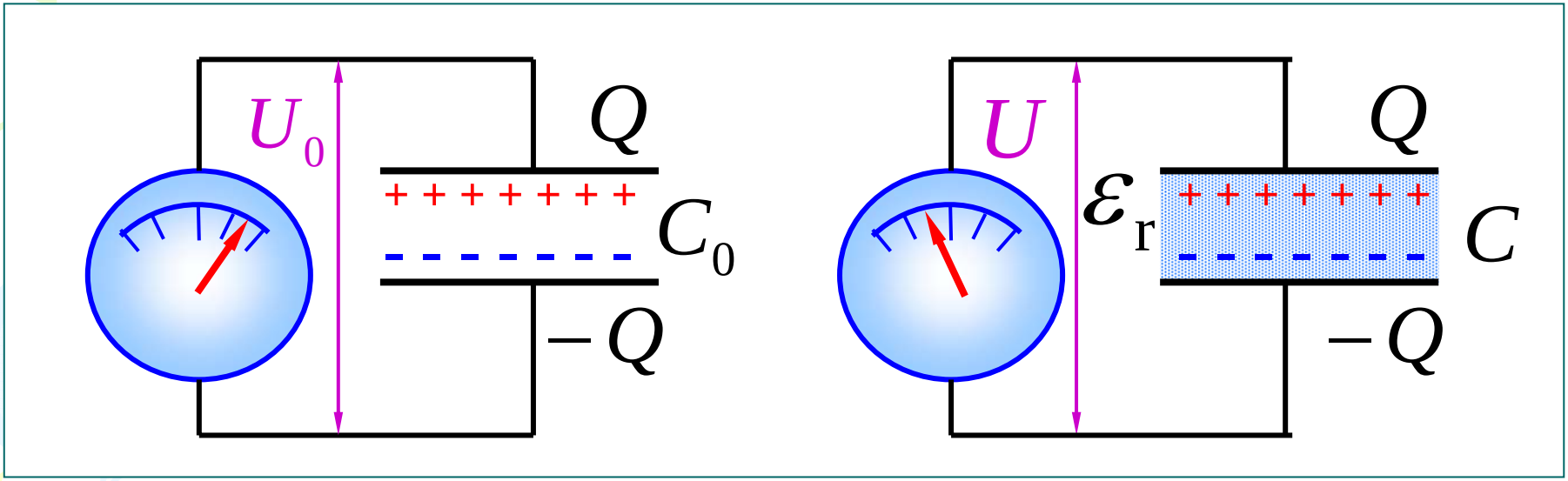
一　电介质对电容的影响　相对电容率



$$U=\frac{1}{\varepsilon_r}U_0 \qquad E=\frac{E_0}{\varepsilon_r}$$

$$C=\varepsilon_r C_0$$

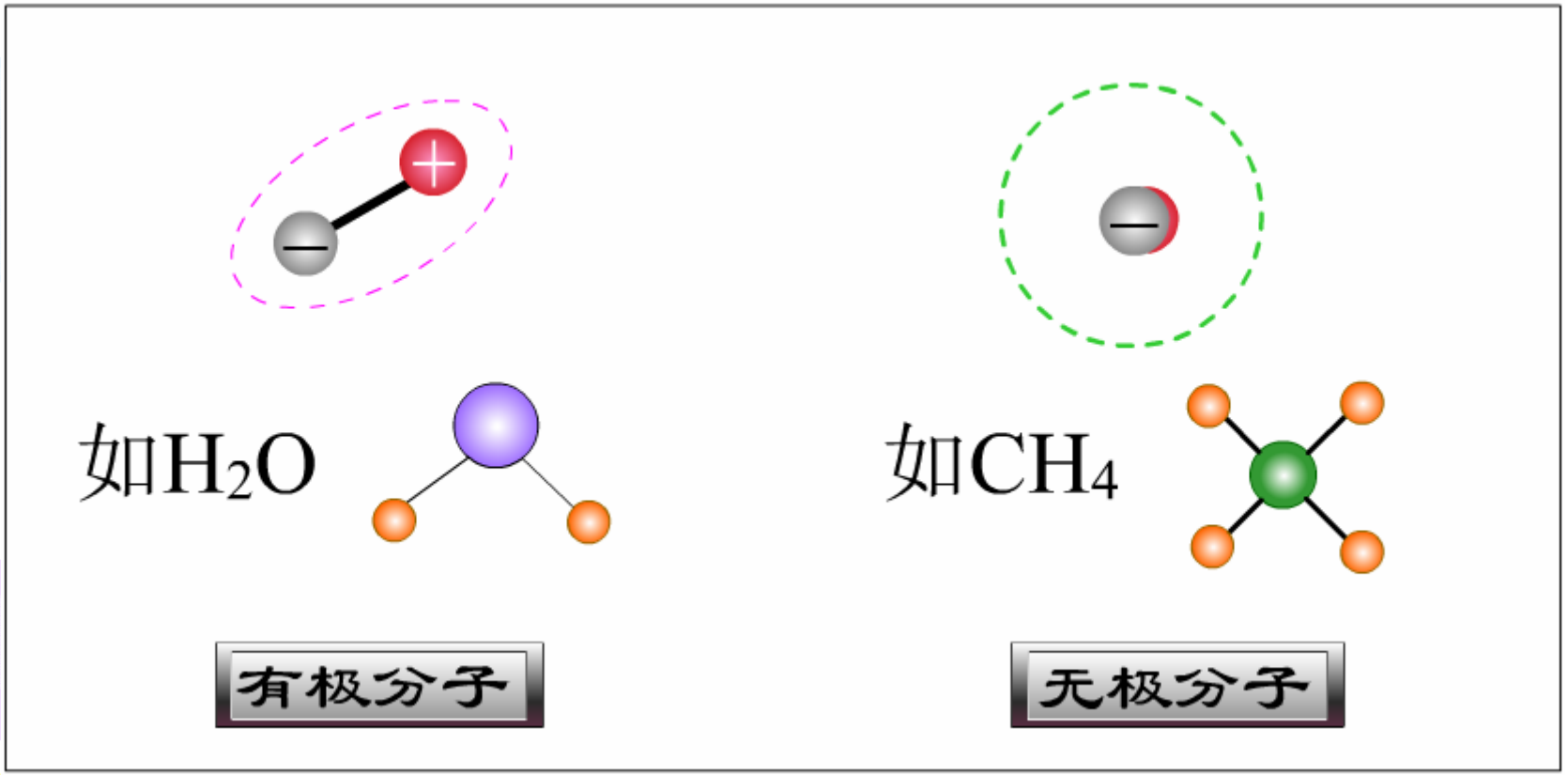
相对电容率 $\varepsilon_r>1$

电容率 $\varepsilon=\varepsilon_0\varepsilon_r$

二　电介质的极化

无极分子电介质：（氢、甲烷、石蜡等）

有极分子电介质：（水、有机玻璃等）



三　电极化强度

$$\vec{P}=\frac{\sum \vec{p}}{\Delta V}$$

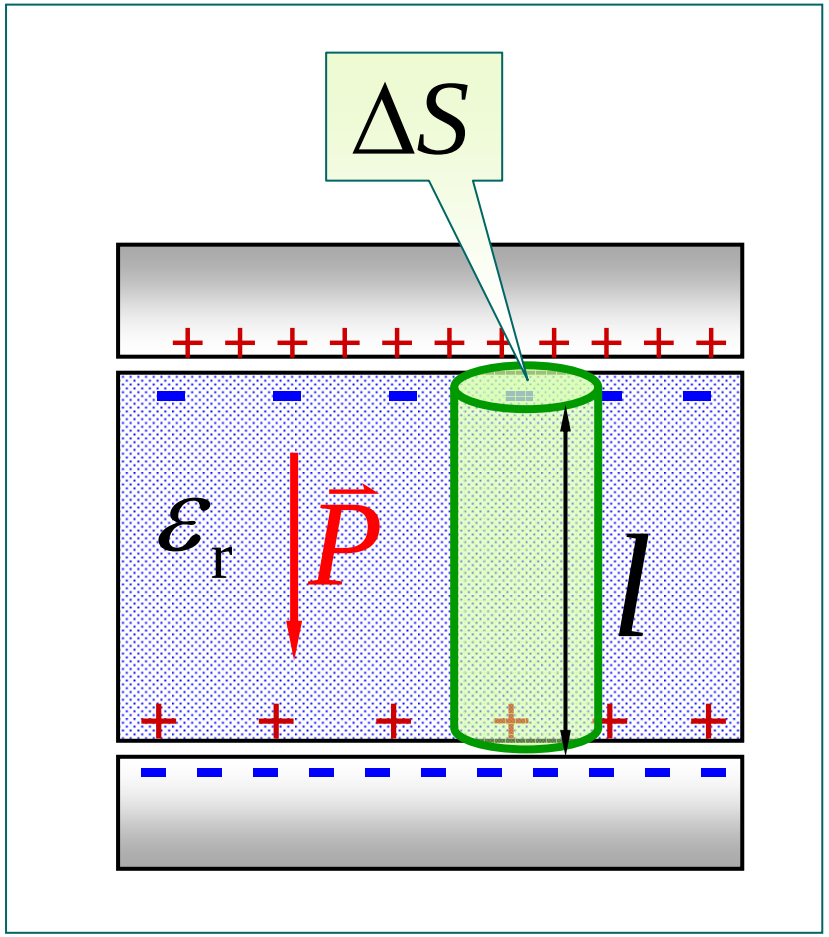
$\vec{p}$:分子偶极矩

$\vec{P}$:电极化强度

$\vec{P}$ 的单位: $\mathrm{C\cdot m^{-2}}$

$$P=\frac{\sum p}{\Delta V}=\frac{\sigma'\Delta Sl}{\Delta Sl}=\sigma'$$

表面极化电荷面密度



$$\sigma'=P_n$$

四　电介质中的电场强度 极化电荷与自由电荷的关系

$$E = E_0 - E' = \frac{E_0}{\varepsilon_r}$$

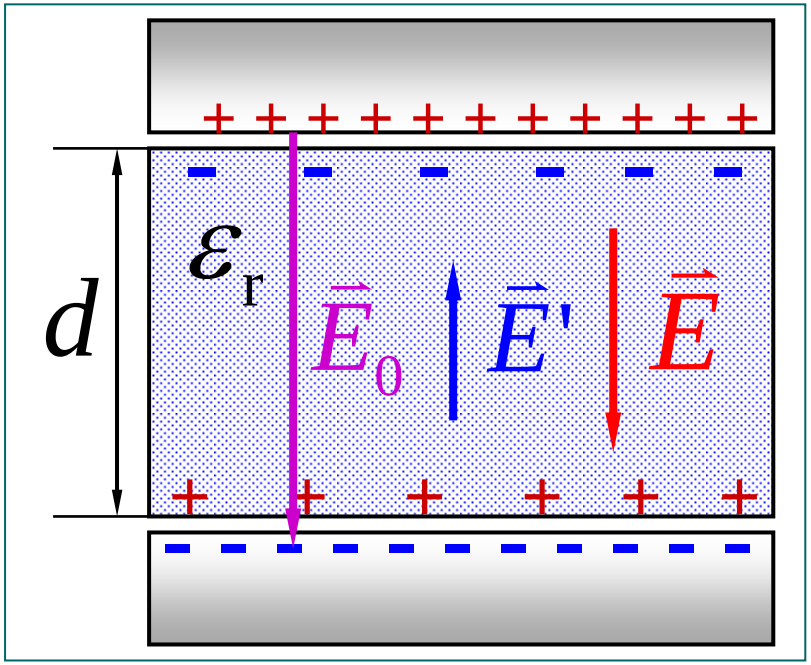
$$E' = \frac{\varepsilon_r - 1}{\varepsilon_r} E_0$$

$$\sigma' = \frac{\varepsilon_r - 1}{\varepsilon_r} \sigma_0$$

$$Q' = \frac{\varepsilon_r - 1}{\varepsilon_r} Q_0$$

$$\vec{P} = (\varepsilon_r - 1)\varepsilon_0 \vec{E}$$

$$\vec{P} = \chi \varepsilon_0 \vec{E}$$



$$E_0 = \sigma_0 / \varepsilon_0$$

$$E = E_0 / \varepsilon_r$$

$$P = \sigma'$$