Answer on Question #73801, Physics / Electric Circuits

Explain the terms polarization surface charges and molecular polarizability for a dielectric material.

Answer:

Molecular polarizability could be explained as following:
All molecules are dipoles, that has dipole momentum. Without electric field these dipoles oriented chaotically, so that total dipole momentum (Polarization) is zero.
As we turn on external electric field, these tiny dipoles reorient along electric field, and so, they more and more sums to total polarization vector. Stronger the electric field, more dipoles orient along field, that's why $\vec{P} \sim \vec{E}$.
When dipoles near the surface reorient, uncompensated charge appear on the surface. On one side, it's positive, on the other – negative