Field Vectors and Polarization Types of Polarization

18.53 Shown below are the relative positions of Ca^{2+} and O^{2-} ions, without and with an electric field present.



Now,

$$d = r_{Ca^{2+}} + r_{O^{2-}} = 0.100 \text{ nm} + 0.140 \text{ nm} = 0.240 \text{ nm}$$

and

$$\Delta d = 0.05 d = (0.05)(0.240 \text{ nm}) = 0.0120 \text{ nm} = 1.20 \text{ x} 10^{-11} \text{ m}$$

From Equation 18.28, the dipole moment, p, is just

 $p = q \Delta d$ = (1.602 x 10⁻¹⁹ C)(1.20 x 10⁻¹¹ m) = 1.92 x 10⁻³⁰ C-m

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