

Coulomb's Law Application problem #2

K is called the DIELECTRIC constant.

Find K for an unknown substance where 2 charges, 50 micro coulombs, and 75 micro coulombs

experience a force of 672 N when they are 12.0 cm apart.

$$F = \frac{k q_1 q_2}{d^2} \quad \text{air} = 9.0 \times 10^9$$

$$K = \frac{F d^2}{q_1 q_2} = \frac{(672 \text{ N})(0.12 \text{ m})^2}{(50 \times 10^{-6} \text{ C})(75 \times 10^{-6} \text{ C})}$$

$$= 2580000000$$

$$2.58 \times 10^9 \frac{\text{N} \cdot \text{m}^2}{\text{C}^2}$$

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