Quiz-06-Nov-2013	Name: solution Id#:	Number: Section: 14

How much work is done by an external agent to turn an electric dipole by an angle of 20° in a uniform electric field of magnitude 700 N/C if the dipole moment has a magnitude of 4.0×10^{-9}C.m and the initial angle is 0°?

$$W_{ext} = \Delta U \qquad U = -\vec{p}\cdot\vec{E}$$

$$= U_f - U_i$$

$$= -pE\cos 20^\circ + pE\cos 0^\circ$$

$$= pE(-\cos 20^\circ + 1)$$

$$= (4\times10^{-9})(700)(-\cos 20^\circ + 1)$$

$$= +1.7\times10^{-7}\ J$$

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