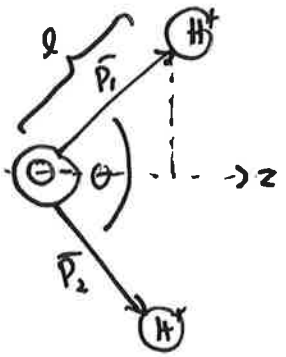
TL 9-16 (Dipole moment of water)

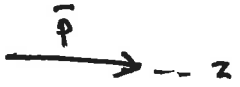


$\theta_{meas} = 104.5°$

$l = 0.0956\,nm$

$|\bar{p}| = 6.16 \times 10^{-30}\ C\,m$

$p_{1z} + p_{2z} = |\bar{p}|$



$p_{1z} = p_{2z} = p_{ionic}$

If p_1 & p_2 were purely ionic dipole moments,

then $p_{ionic} = el = 1.532e-29$ C-m

and $p_{ionic,z} = p_{ionic} \cos\left(\frac{\theta}{2}\right) = 9.38e-30$

Since there are 2 of them $p_{ionic,z,total} = 1.875e-29$ C-m

Comparing this to the measured value, $p_{meas} = 6.16e-30$,

we see that

$$\frac{p_{meas}}{p_{ionic}} = 0.34$$

So it's **34% ionic**