#### Wave numbers for HF and HCI

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Solution: You will need to use the reduced mass for each molecule. Using the fact that

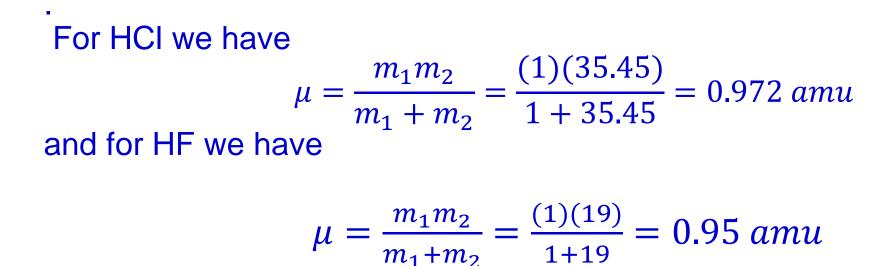
$$\tilde{\nu} = \frac{1}{2\pi c} \sqrt{\frac{k}{\mu}}$$

You need to calculate the force constant,

$$k = 4\pi^2 \mu c^2 \tilde{\nu}^2$$

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#### 870 N/m

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Inserting these values we find for HCI

$$k = 4\pi^2 (0.972) (1.66 \, x 10^{-27}) (2.99 \, x 10^{10})^2 (2940)^2$$

$$k = 492 \frac{N}{m}$$

for HF

 $k = 4\pi^2 (0.95)(1.66 x 10^{-27})(2.99 x 10^{10})^2 (3910)^2$ 

$$k = 850 \frac{N}{m}$$