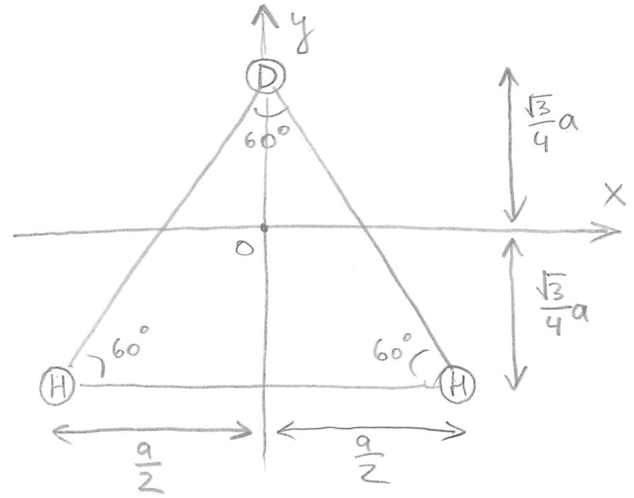

From the symmetry of the molecule and the fact that the D atom has the same mass as two H atoms it is easy to see that the center of mass lies not in the center of the equilatoral triangle, but shifted towards D. The y-position of D is $\frac{\sqrt{3}}{4}a$, while the y-position of both H atoms is $-\frac{\sqrt{3}}{4}a$. Looking at the scetch above we can write the tensor of inertia. Note that the z-coordinates of all atoms are zeros.

$$I = \sum_i \begin{bmatrix} m_i(y_i^2+z_i^2) & -m_i x_i y_i & -m_i x_i z_i \\ -m_i x_i y_i & m_i(x_i^2+z_i^2) & -m_i y_i z_i \\ -m_i x_i z_i & -m_i y_i z_i & m_i(x_i^2+y_i^2) \end{bmatrix} = \sum_i \begin{bmatrix} m_i y_i^2 & -m_i x_i y_i & 0 \\ -m_i x_i y_i & m_i x_i^2 & 0 \\ 0 & 0 & m_i(x_i^2+y_i^2) \end{bmatrix} =$$

$$= m \begin{bmatrix} 2\cdot\frac{3}{16}a^2 + \frac{3}{16}a^2 + \frac{3}{16}a^2 & 0 & 0 \\ 0 & \frac{1}{4}a^2 + \frac{1}{4}a^2 & 0 \\ 0 & 0 & 2\cdot\frac{3}{16}a^2 + \frac{3}{16}a^2 + \frac{3}{16}a^2 + \frac{1}{4}a^2 + \frac{1}{4}a^2 \end{bmatrix} =$$

$$= m \begin{bmatrix} \frac{3}{4}a^2 & 0 & 0 \\ 0 & \frac{1}{2}a^2 & 0 \\ 0 & 0 & \frac{5}{4}a^2 \end{bmatrix}$$

As we can see the tensor of inertia is already diagonal in the chosen coordinate system and

$$I_1 = \frac{3}{4}ma^2 \qquad I_2 = \frac{1}{2}ma^2 \qquad I_3 = \frac{5}{4}ma^2$$