The n-th Bohr's orbit radius is

$$R_n = \frac{4\pi\varepsilon_0\hbar^2}{Zm_e e^2}n^2,$$

where the $\varepsilon_0 = 8.85 \times 10^{-12}\ F/m$ is the vacuum permittivity, $\hbar = 1.05 \times 10^{-34} J \cdot s$ is the Plank constant, n is the number of orbit ($n = 2$ in the our case), Z it the charge of the atom's core ($Z = 1$ for the atom of Hydrogen), $m_e = 9.1 \times 10^{-31} kg$ is the mass of electron and $e = 1.6 \times 10^{-19} C$ it the modulus of the electron charge. For the stationary orbit the following condition is met:

$$m_e v R_n = n\hbar,$$

where v is the electron's speed. One can calculate the frequency as

$$f = \frac{1}{T} = \frac{v}{2\pi R_n}.$$

Thus substituting the expressions for R_n from the first formula and for v from the second one, one obtains the expression for the frequency

$$f = \frac{Z^2 m_e e^4}{32\pi^3\varepsilon_0^2\hbar^3 n^3}.$$

For the Hydrogen one gets $f = 8.3\ THz$.