For the 127I35Cl molecule, the following transitions are detected in the infrared. From this data, deduce the harmonic vibrational frequency ($\tilde{ω}\_{e}$) and the vibrational anharmonicity ($\tilde{ω}\_{e}\tilde{x}\_{e}$), both in units of cm-1. Note that the following are the result of careful spectroscopic study that can detect weak, “forbidden” transitions (overtones like $0\rightarrow $2).

 Transition Frequency (cm-1)

 $0\rightarrow $1 381.20

 $0\rightarrow $2 759.60

 $ 0\rightarrow $3 1135.00

 $ 0\rightarrow $4 1507.40

 $ 0\rightarrow $5 1877.00