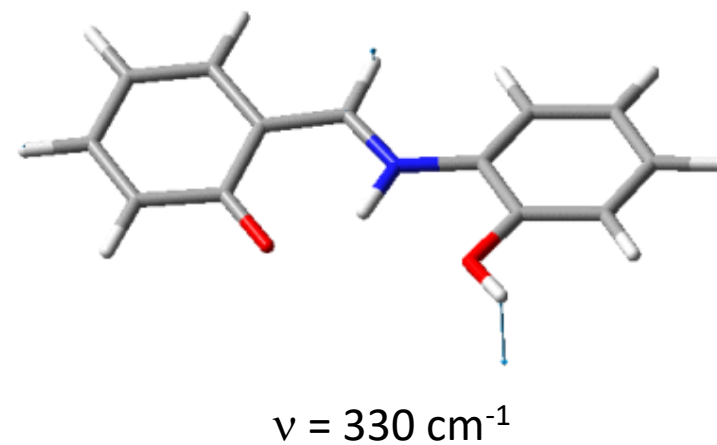
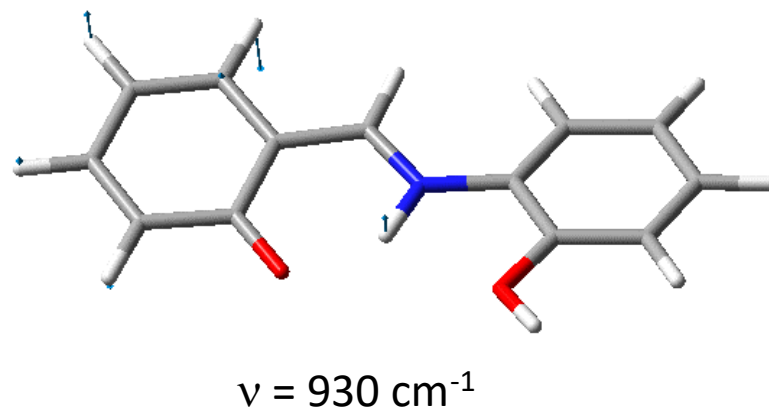
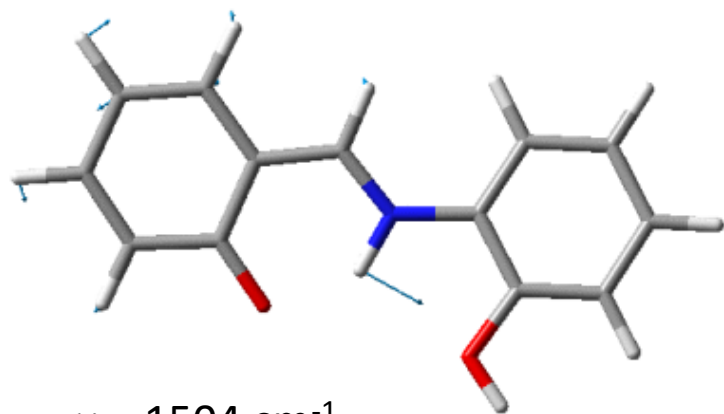
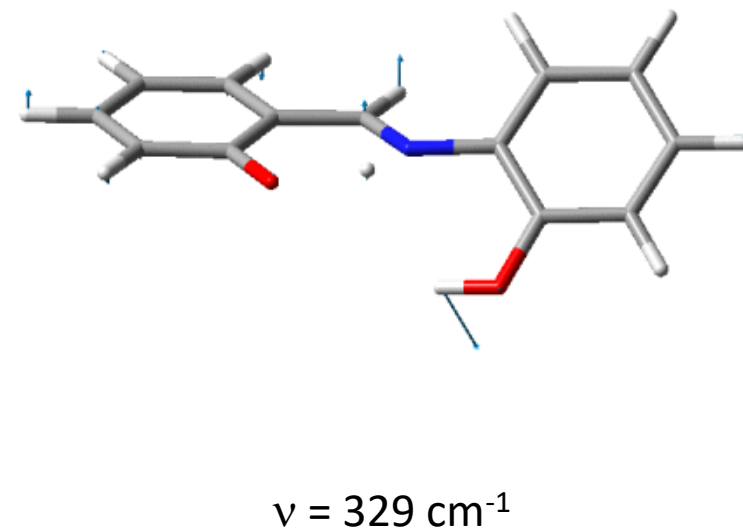
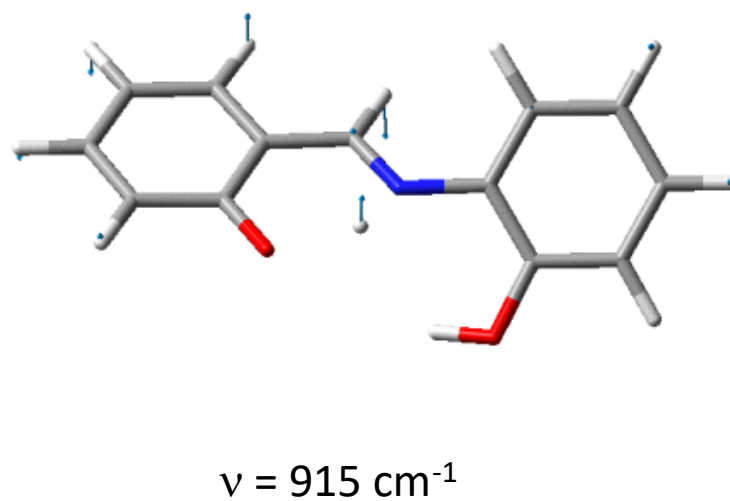
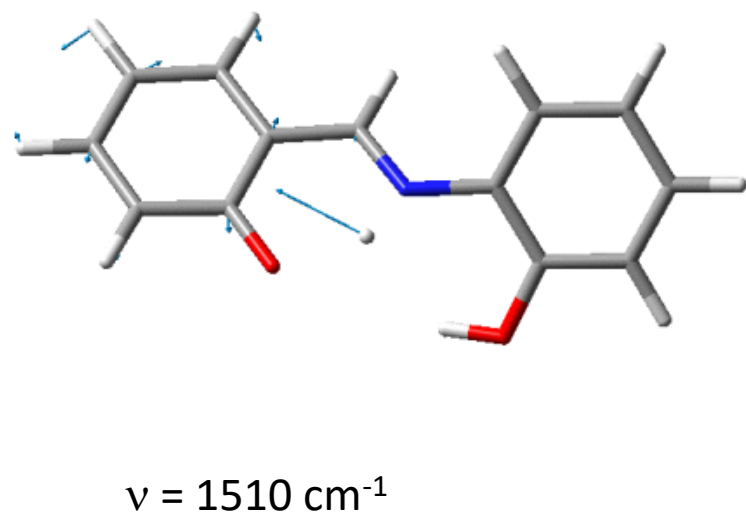


## Calculated vibrations in the Z-keto form ground state

### Lowest-energy conformer

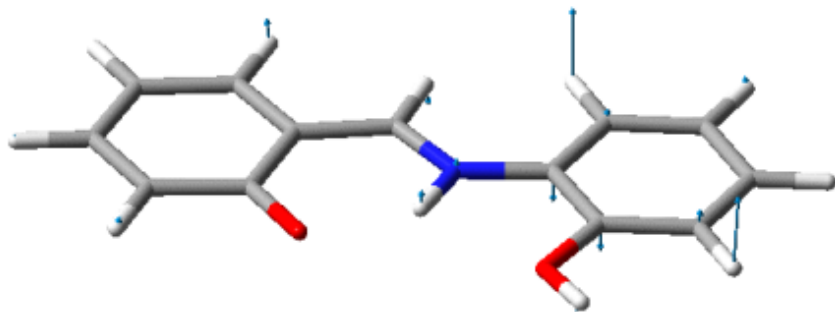


### Higher-energy conformer

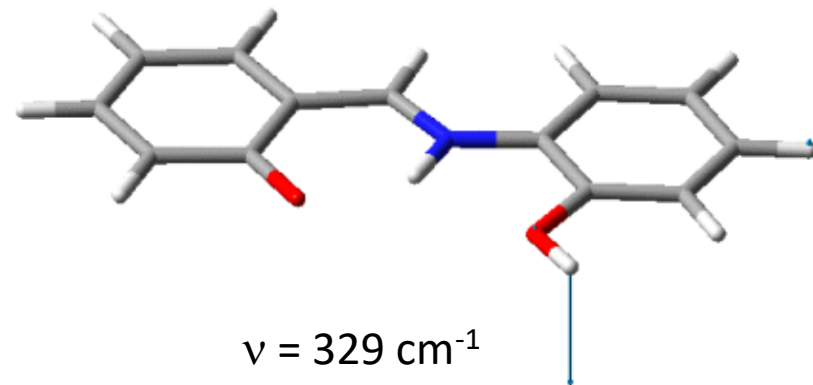


## Calculated vibrations in the Z-keto form excited state

### Lowest-energy conformer

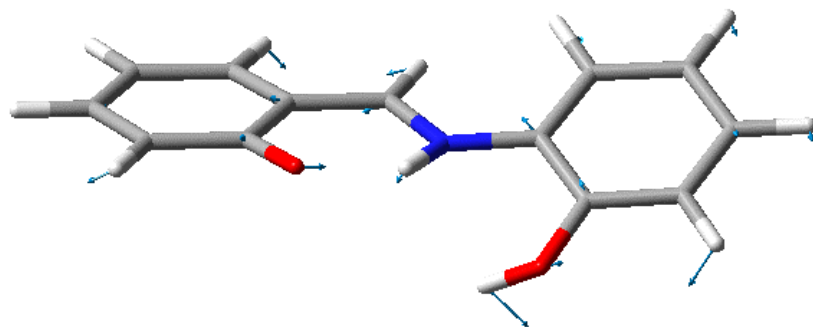


$\nu = 447 \text{ cm}^{-1}$

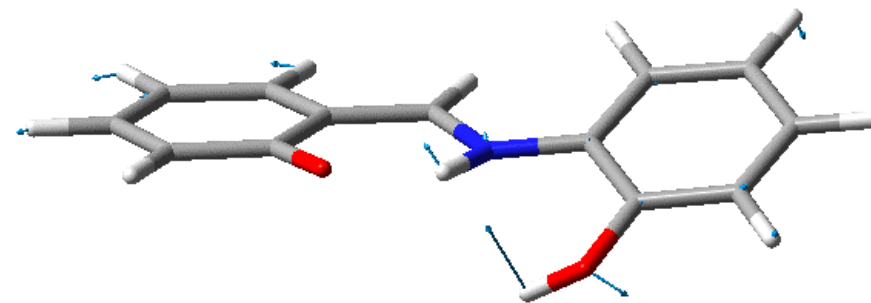


$\nu = 329 \text{ cm}^{-1}$

### Higher-energy conformer



$\nu = 445 \text{ cm}^{-1}$



$\nu = 219 \text{ cm}^{-1}$