

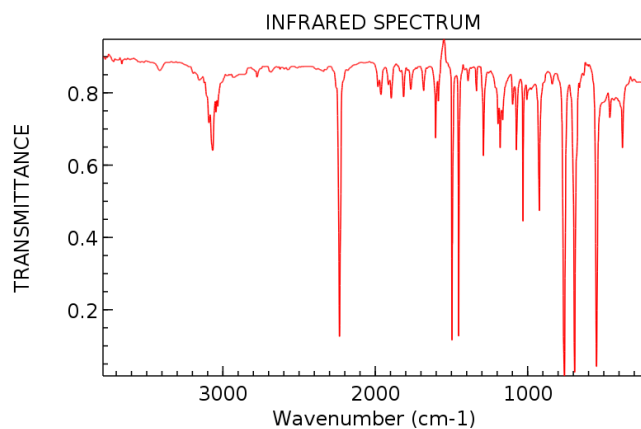
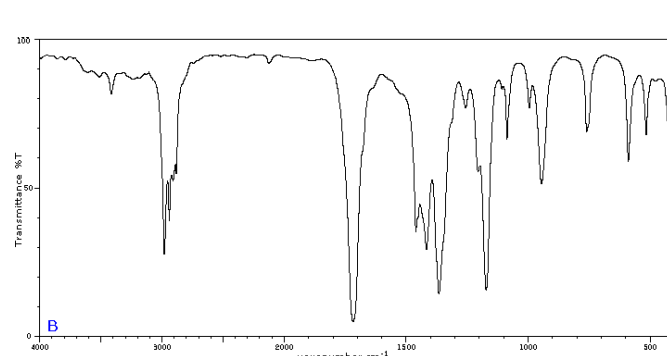
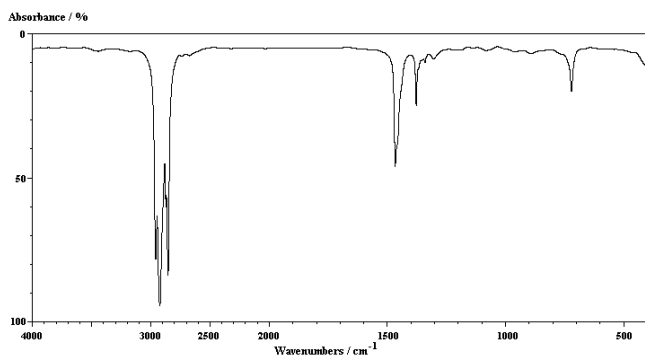
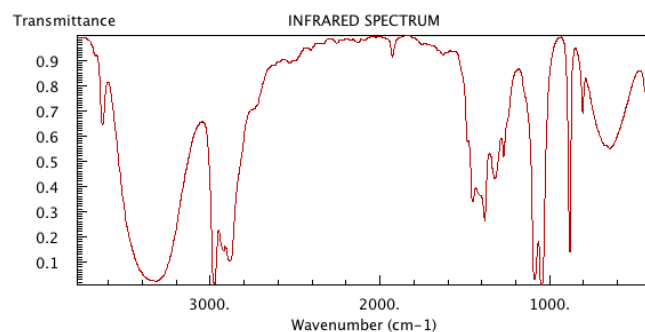
Quiz 11.3 – Vibrational Spectroscopy

Name: _____

Functional Groups

These are infrared spectra for (in no particular order) a ☐ Nitrile, ☐ Alkane, ☐ Alcohol, and ☐ Ketone

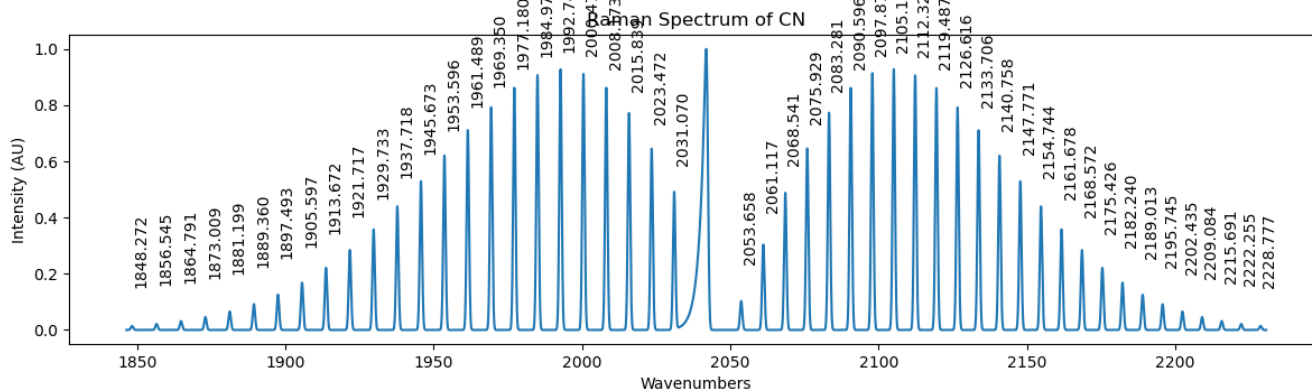
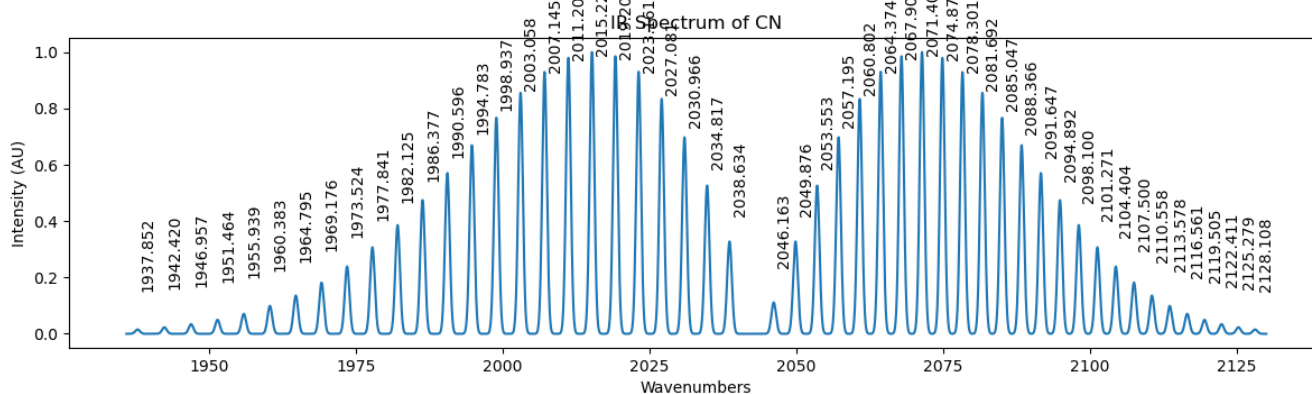
Label each spectra according to the correct functional group, and circle the feature or features on each infrared spectrum which you used to identify it

NIST Chemistry WebBook (<https://webbook.nist.gov/chemistry>)

Ro-Vibrational Spectra

Below are IR and Raman spectra of the CN radical. Annotate them by labeling the following:

1. O, P, Q, R, and S branches
2. Initial and final states for the first 3 transitions in each branch
3. α_e
4. \tilde{B}_e , \tilde{B}_0 , and \tilde{B}_1



Vibrational Anharmonicity and Birge-Sponer Plots

Below is a table of the first few vibrational transitions for the CN radical

States	Energy (cm^{-1})
$1 \leftarrow 0$	2042.416
$2 \leftarrow 1$	2016.242
$3 \leftarrow 2$	1990.068
$4 \leftarrow 3$	1963.894
$5 \leftarrow 4$	1937.720

Draw or print a Birge-Sponer plot and give the following quantities:

1. $\tilde{\nu}$
2. $\chi_e \tilde{\nu}$
3. \tilde{D}_e
4. \tilde{D}_0

귀천 (*Back to Heaven*)

By 천상병 (Cheon Sang-byeong)

나 하늘로 돌아가리라
새벽빛 와 닿으면 스러지는
이슬 더불어 손에 손을 잡고,

나 하늘로 돌아가리라.
노을빛 함께 단둘이서
기슭에서 놀다가 구름 손짓하며는,

나 하늘로 돌아가리라.
아름다운 이 세상 소풍 끝내는 날,
가서, 아름다웠더라고 말하리라...

I'll go back to heaven again
hand in hand with the dew
that melts at the touch of the dawning day,

I'll go back to heaven again.
After playing on the slopes with the dusk,
when the clouds beckon,

I'll go back to heaven again.
On the last day of my outing to this beautiful world,
I'll go back and say: it was beautiful...