

Quiz 11.1 – Molecular Spectroscopy

Name: _____

Lineshapes

Find the doppler broadening width (in cm^{-1}) for two gas samples, with $v_{avg} = 425 \text{ m/s}$ and $v_{avg} = 1650 \text{ m/s}$

An O_2 gas molecule at standard temperature and pressure will undergo a collision about every 100 ps . Find the lifetime broadening width (in cm^{-1}), assuming that the excited state lifetime is limited by molecular collisions.

An O_2 gas molecule under very low pressures (say, within a nebular cloud in space) may undergo a collision about every 5 s . Find the lifetime broadening width (in cm^{-1}), assuming that the excited state lifetime is limited by molecular collisions.

Элегия (*Elegy*)

Ву Александр Сергеевич Пушкин (Alexander Sergeyevich Pushkin)

Безумных лет угасшее веселье
Мне тяжело, как смутное похмелье.
Но, как вино — печаль минувших дней
В моей душе чем старе, тем сильнее.
Мой путь уныл. Сулит мне труд и горе
Грядущего волнуемое море.

Но не хочу, о други, умирать;
Я жить хочу, чтоб мыслить и страдать;
И ведаю, мне будут наслажденья
Меж горестей, забот и треволненья:
Порой опять гармонией упьюсь,
Над вымыслом слезами обольюсь,
И может быть — на мой закат печальный
Блеснет любовь улыбкою прощальной.

The vanished joy of my crazy years
Is as heavy as gloomy hang-over.
But, like wine, the sorrow of past days
Is stronger with time.
My path is sad. The waving sea of the future
Promises me only toil and sorrow.

But, O my friends, I do not wish to die,
I want to live – to think and suffer.
I know, I'll have some pleasures
Among woes, cares and troubles.
Sometimes I'll be drunk with harmony again,
Or will weep over my visions,
And it's possible, at my sorrowful decline,
Love will flash with a parting smile