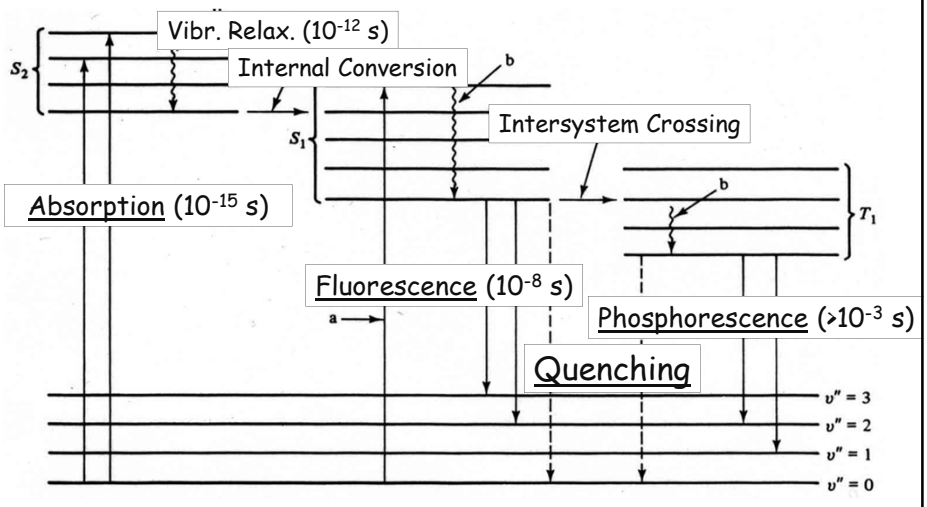
February 13, 2012

- **Exam #1 Info Page!**
  - **Wed, Feb 15th, 7 pm, Perkins 107**
- **REMINDER:**
  - ***Wednesday's Class is for Review/Questions***
    - ***Email me with questions you want covered!***

1

Jablonski Diagram



Spectroscopy:
Instrumentation

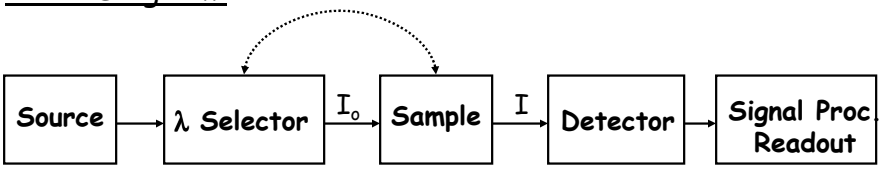
Chem 221

Instrumental Analysis

Spring 2012

Spectrometer Configuration

Block Diagram:



- Continuum
- Line

- Dispersive
- Non-Dispersive

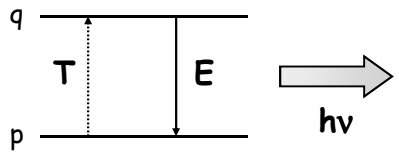
- Liquids
- Gases
- Solids

- Single-Channel
- Multi-Channel

4

Line Sources

- Most line sources rely on *spontaneous emission* from *thermally-excited* **gas-phase** atoms/ions:



Emission rate = $-dN_q/dt = N_q A_{qp}$

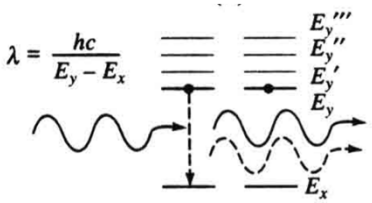
Excited state population

Einstein Spontaneous Emission Transition Probability

5

LASERs: The *Ultimate* Line Sources

- Based on *Stimulated Emission:*



Light **A**mplification by **S**timulated **E**mission of **R**adiation

6

Absorption versus Stimulated Emission

- Two processes can occur when a system is presented with EMR: