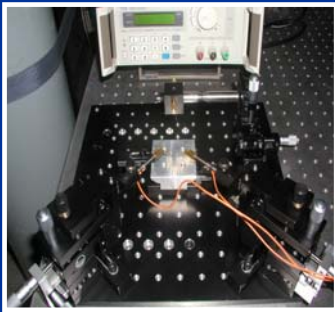


Electroluminescence (EL) System

Electroluminescence (EL)

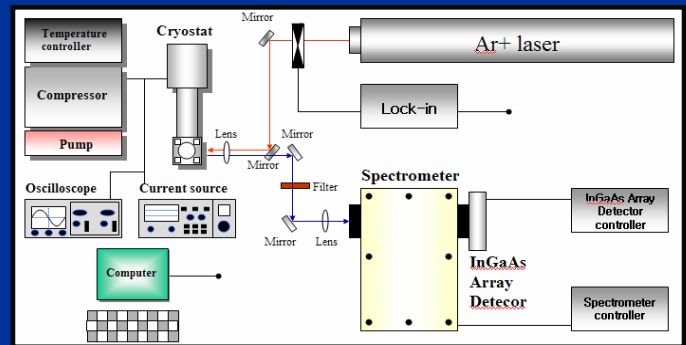


System features

- EL is an optical phenomenon and electrical phenomenon where a material such as a natural blue diamond emits light when an current is passed through it.

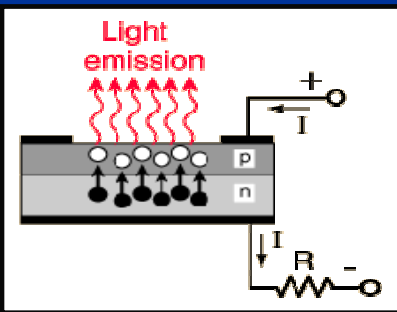
- EL is mainly observed in semiconductors.
- It refers to the luminescence produced by some materials when exposed to an electric field, as opposed to heat (incandescence) or chemicals.

EL Schematic

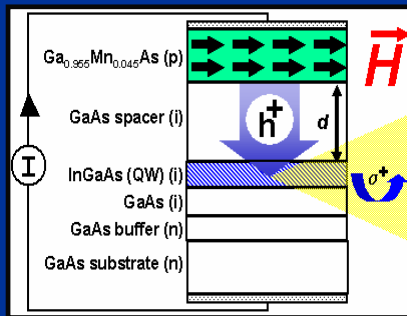


- The electric field excites electrons in the material which then emit the excess energy as photons.
- LEDs are the most well known example of EL

Principle of EL (Vertical and Horizontal type)



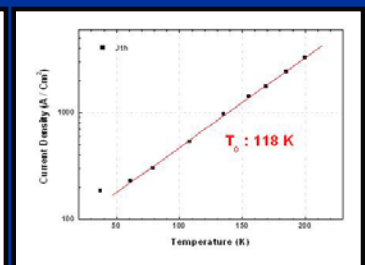
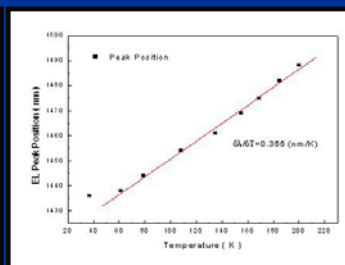
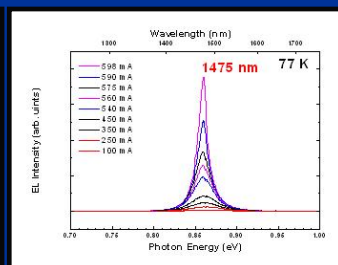
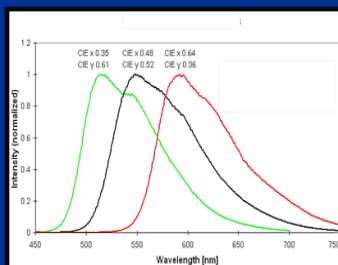
Vertical emission type



Horizontal emission type

- LEDs are p-n junction devices constructed of gallium arsenide (GaAs), gallium arsenide phosphide (GaAsP), or gallium phosphide (GaP). Silicon and germanium are not suitable because those junctions produce heat and no appreciable IR or visible light. The junction in an LED is forward biased and when electrons cross the junction from the n- to the p-type material, the electron-hole recombination process produces some photons in the IR or visible in a process called electroluminescence. An exposed semiconductor surface can then emit light.

EL Spectra (Vertical and Horizontal type)



- Light emission devices (LEDs) spectra are changed with active conditions.
- Laser diodes (LD) spectra increase with increasing injection current
- Characteristic temperature and lasing peak-shift result in EL spectra.