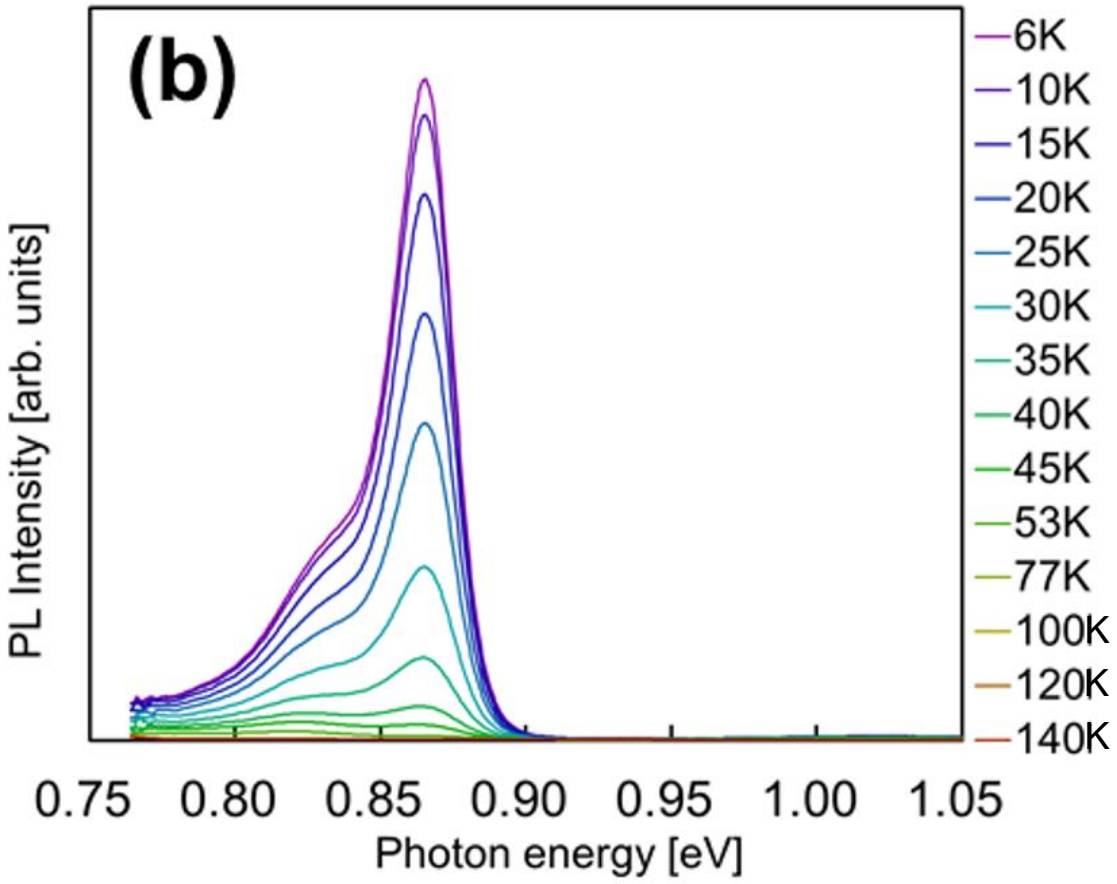
Advanced Topics on Spectroscopy 2020 report 5



An above figure shows PL (photoluminescence) spectra from a direct band gap semiconductor which band gap energy is about 1.0 eV. Draw a PL observation system to observe the above figure.

To draw observation system, use elements shown in following pages.
(note: you can use the elements more than once. To draw observation system, you don't have to consider distance between optical elements. However, you must consider the direction of lenses, direction of the optical path (for example, reflection angle)).

1. excitation source
Xe lamp, Hg-Xe lamp, He-Ne laser, Ar ion laser, SH of DPSS CW Nd^{3+} YVO_4 laser, FH of Q-Switch $Nd^{3+}YVO_4$ laser, He-Cd laser, KrF Excimer laser, ArF Excimer laser
(In the your report, show wavelength of selected excitation source. Some excitation sources have several wavelength.)

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2. lens

plane-convex lens (Quartz) f50, f75, f100, f150, f200

plane-convex lens (BK7) f50, f75, f100, f150, f200

* f means focal length

*effective diameter of the lens is 30 mm.

3. Glass filter

L37, L38, L39, L42, Y44, Y48, Y50, Y52, O54, O56, O58, R60, R62, R64, R66, R70, R72, IR76N, IR80N, IR83M, IR85N, RM90, RM100, B370, B410, B440, B460, G530, G533, G545, G550, U330, U340, U360

*See https://www.hoyacandeo.co.jp/english/products/eo_index.html

4. mirror

MgF_2+Al mirror, Ag mirror,

dielectric mirror (reflectance at 532 nm 99%, transmittance at 1064 nm 95%, incident angle 45 deg)

dielectric mirror (reflectance at 325 nm 99%, incident angle 45 deg)

dielectric mirror (reflectance at 248 nm 99%, incident angle 45 deg)

dielectric mirror (reflectance at 193 nm 99%, incident angle 45 deg)

5. detector

Si-CCD 1024ch, InGaAs-CCD 512ch, PMT(1P28), PMT(R2949), PMT(R5509-73) , PMT(R5509-43)

*See http://www.hamamatsu.com/jp/en/product/category/index.html

6. detection system

Lock-in amplifier, photon counter, AD-converter, chopper, DA-converter, chopper, PC (personal computer)

7. monochromator or polychromator

Single monochromator, Single polychromator

where,

blaze wavelength: Choice from 300 nm, 500 nm, 750 nm, 1000 nm.

focal length, reciprocal linear dispersion (reciprocal dispersion) , F-number: choice from

(1)1 m, 1.7 nm/mm, 7.8, (2)50 cm, 3.4 nm/mm, 4.4, (3)20 cm, 8.5 nm/mm, 3.7,

(4)10 cm, 17 nm/mm, 3.3.

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8.otheres
Cryostat

Deadline 2020/7/3 15:00(JST)
Submitting place: mail box at room 406 of the electrical engineering building.

Write your e-mail address which can receive from tanaka@vos.nagaokaut.ac.jp.
If your score is less than 60, I will inform you. If your written address rejected my mail, I will not inform you.

If you resubmit report, your final score of this report is 80% of resubmit report, however, if the final score is higher than 60, your final score of this report is 60. You can resubmit only one time.