

# Solvatochromism



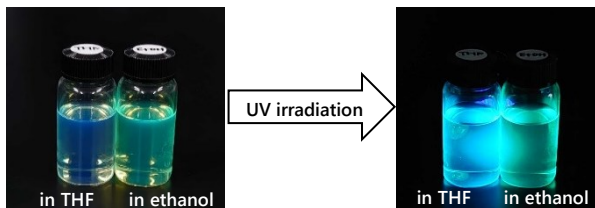
## Dye/fluorescent molecules

- Molecules that absorb visible light have color (dyes)
- Some dyes emit fluorescence in the visible region
- Typically, the color absorbed by a molecule (or its solution) is not the same as the color it fluoresces

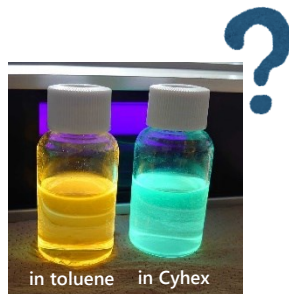


## Solvatochromism

- Some dyes show different colors in different solvents
- Fluorescence color can differ in different solvents as well
- These phenomena are a result of **solvatochromism**



Solution of coumarin 314

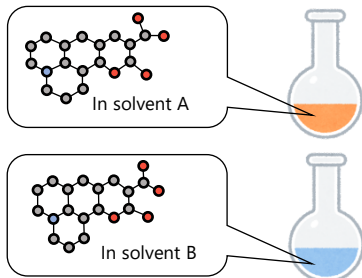


Another example of solvatochromism

## Why the color change?

### • Solvatochromism in absorption

A change in molecular structure caused by surrounding solvent molecules alters the energy level of the dye molecules, resulting in light absorption of a different color.



### • Solvatochromism in fluorescence

Energy relaxation in the form of **structural change** and **reorientation of solvent molecules** occurs after photoexcitation. The degree of the relaxation depends on the solvent. Most fluorescent dyes emit redder fluorescence in more polar solvents.

