

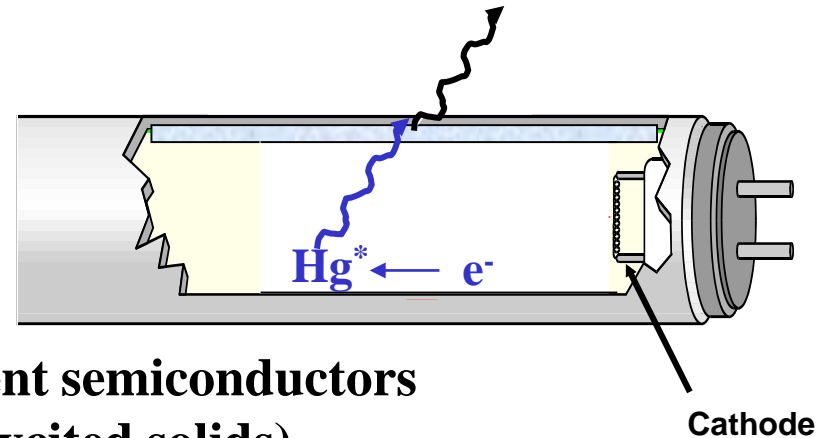
3. Physical Concepts of Light Generation

Black body radiator
Incandescent solid state
compounds or metals

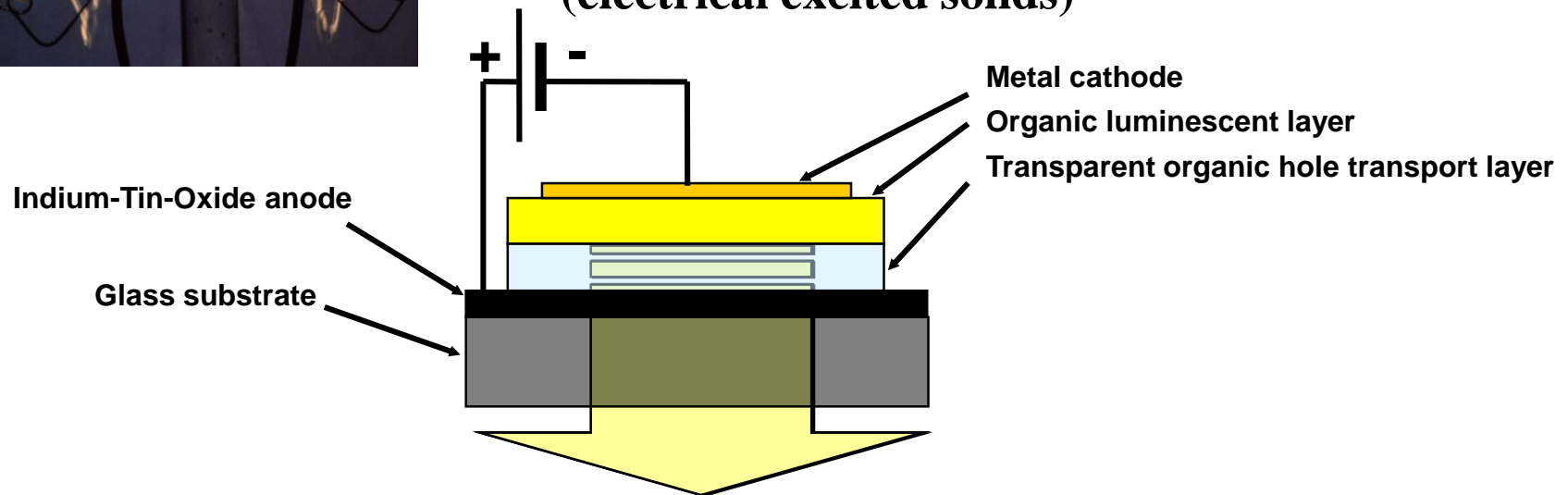


Tungsten coil

Gas discharges
(excited gas atoms/molecules)



Electroluminescent semiconductors
(electrical excited solids)



3. Physical Concepts of Light Generation

Generation of white and colour light

Black body radiators

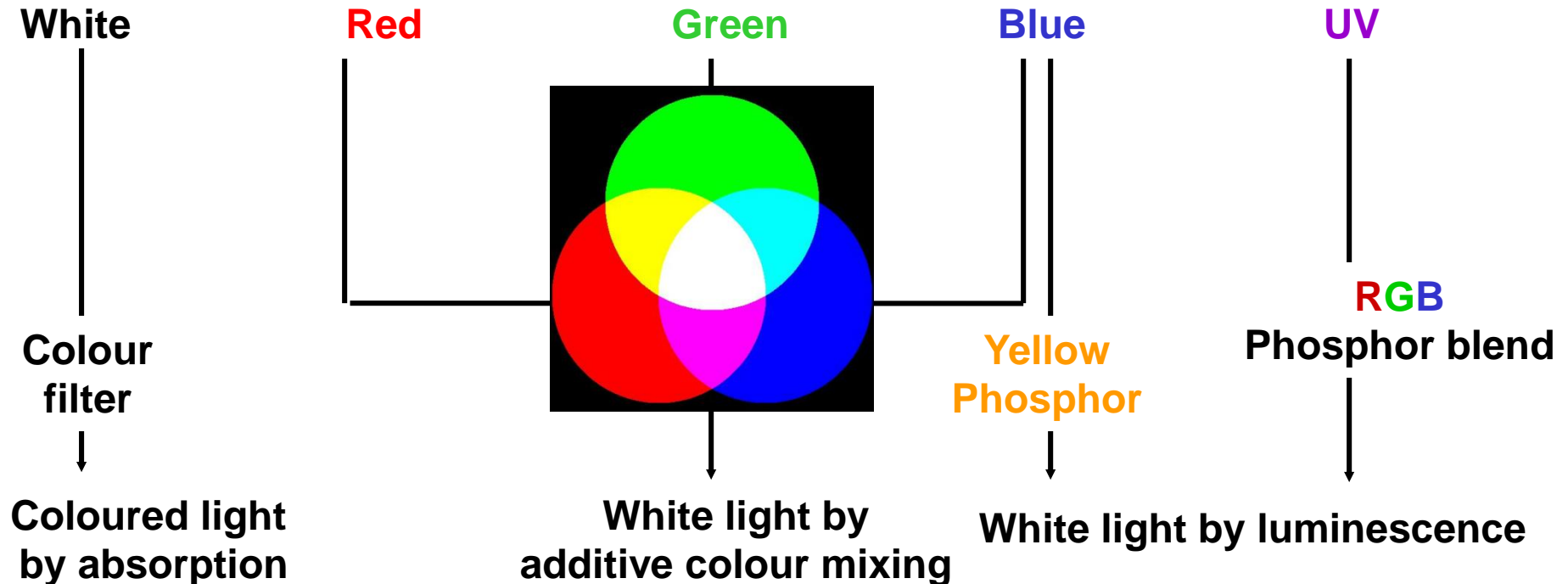
⇒ visible white light + IR

Gas discharges

⇒ UV + visible coloured light

Electroluminescent semiconductors

⇒ visible coloured light



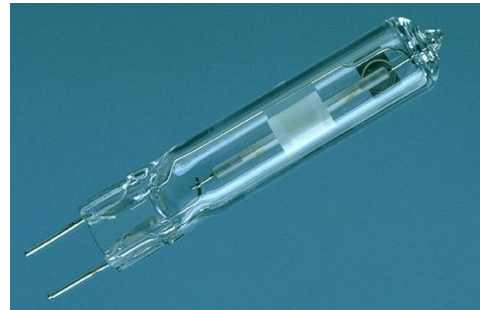
3. Physical Concepts of Light Generation

Classification of light sources

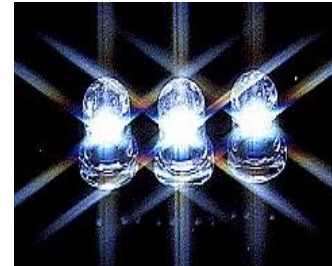
Incandescent and halogen lamps



Gas discharge lamps/displays



Inorganic + organic light emitting diodes



Exotics

Laser

Laser diodes

**Cluster lamps
(Discharge and incandescence)**

Chemical light sources

thermal →

non-thermal

non-thermal

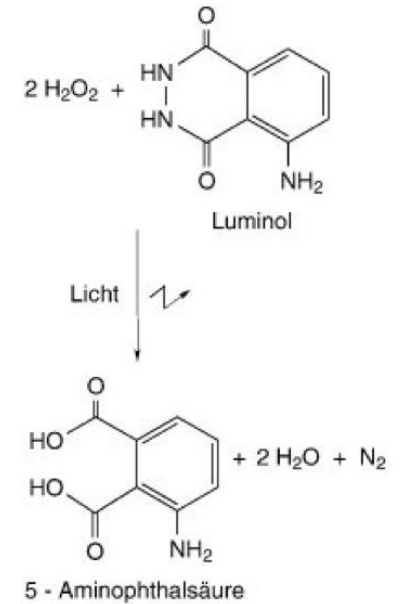
non-thermal

3. Physical Concepts of Light Generation

Chemical light sources: Bio- and chemiluminescence

Chemiluminescence

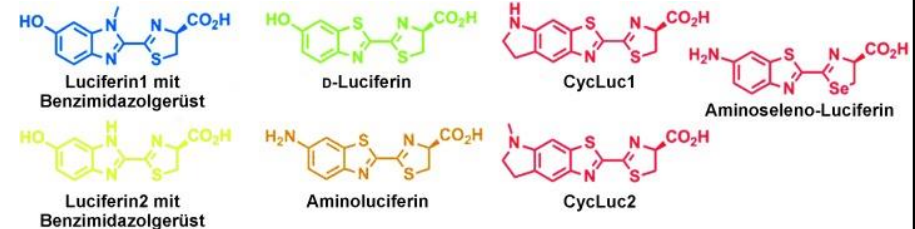
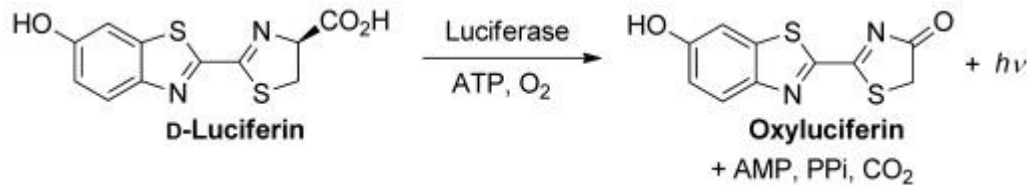
Generation of light by a chemical reaction, e.g. cleavage of luminol



Bioluminescence

Chemiluminescence in living organisms such as

- insects like fireflies
- deep sea organisms like the Anglerfish
- jellyfish like *Aequorea victoria*
- microorganisms



Ref.: W. Guo et al., *Angew. Chem.* 124 (2012) 8554