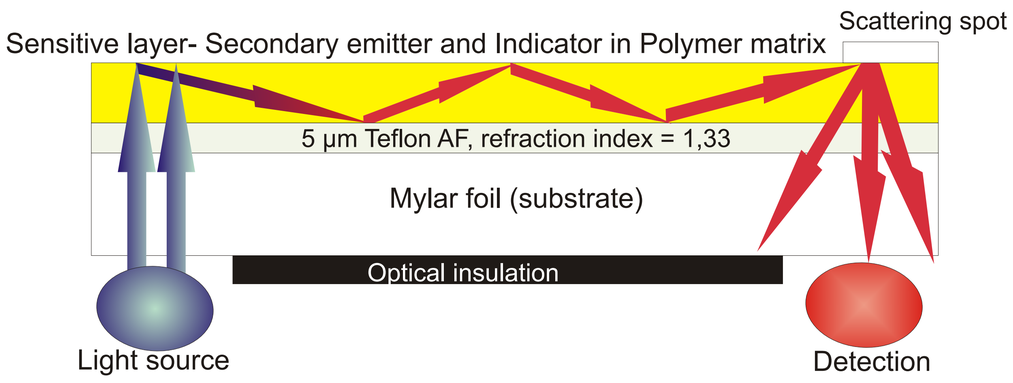
Sensor principle for organic optoelectronic devices using a secondary light source

Barbara Enko, Torsten Mayr, Ingo Klimant

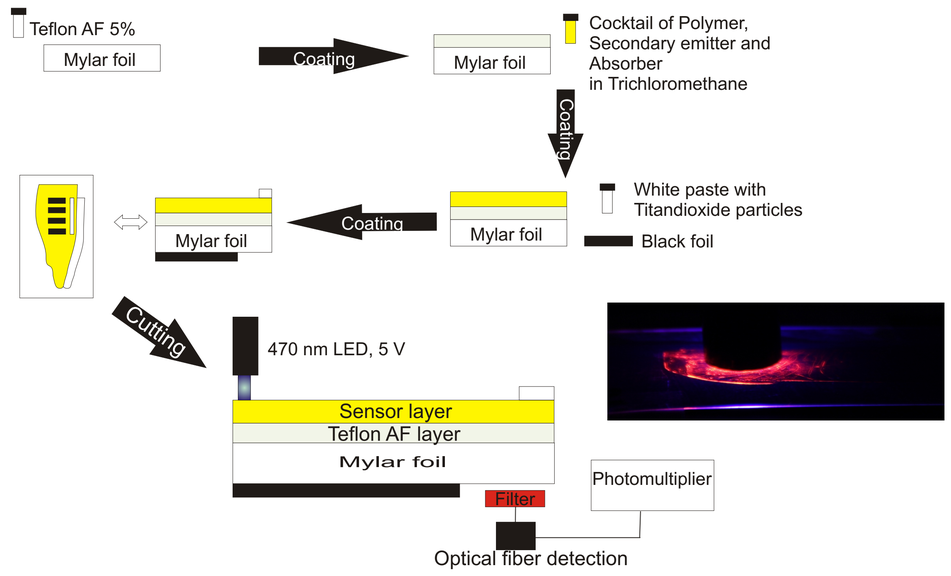
Institute of Analytical Chemistry, Chemo- and Biosensor Workgroup, phone: 0316 / 873 4324, email: torsten.mayr@tugraz.at

Sensor principle

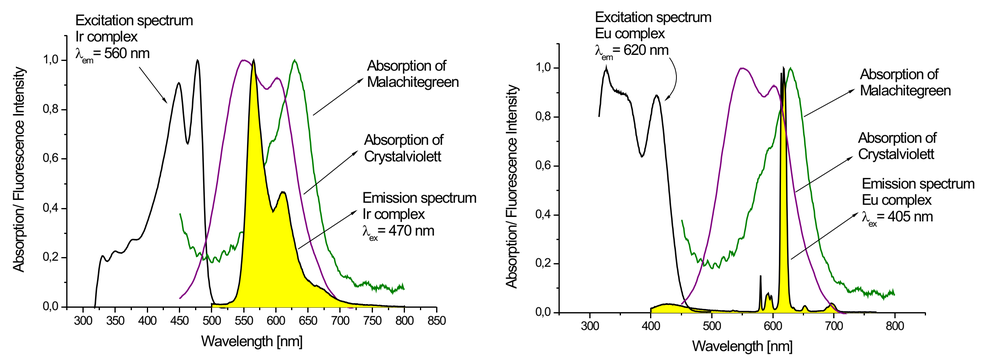


An indicator dye and an inert luminescent dye (secondary emitter) are incorporated in the a polymer layer. The luminescent dye is excited by the light source (LED). The emitted light is guided in the polymer layer by total reflection due to the low refraction index of the Teflon AF. The guided light is coupled out out the wave-guide by a scattering spot and detected. The measured signal depends on the amount of light absorbed by the indicator dye

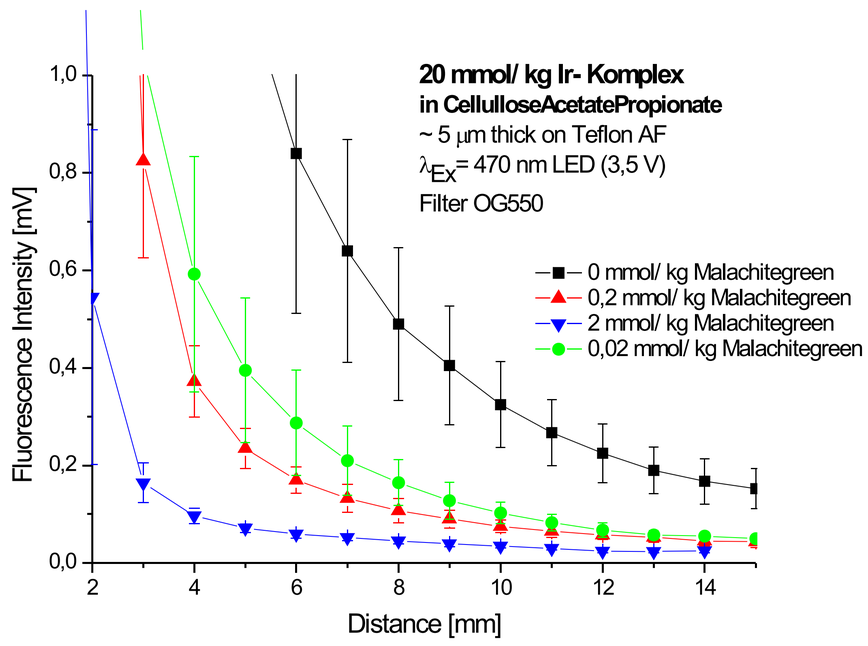
Processing and measuring setup



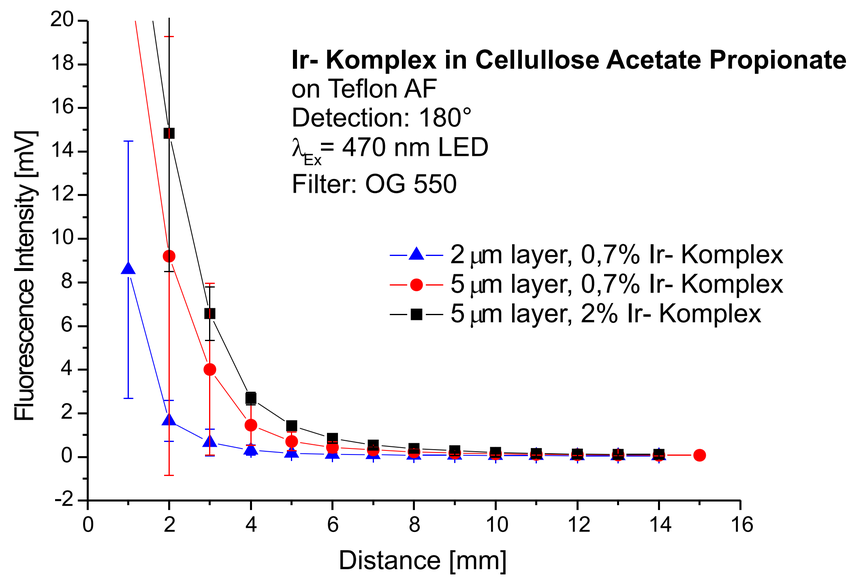
Secondary emitter and Absorbtion dyes

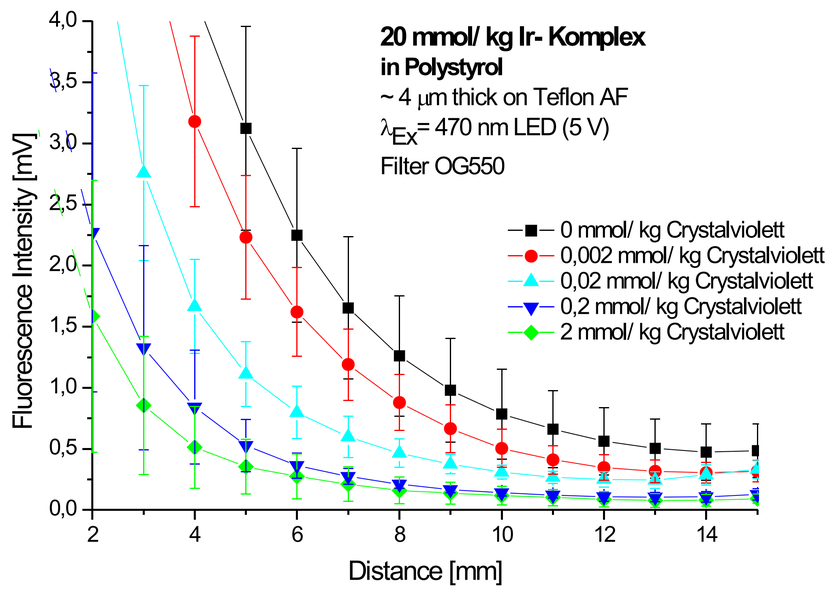


Variation of Absorbtion dye concentration

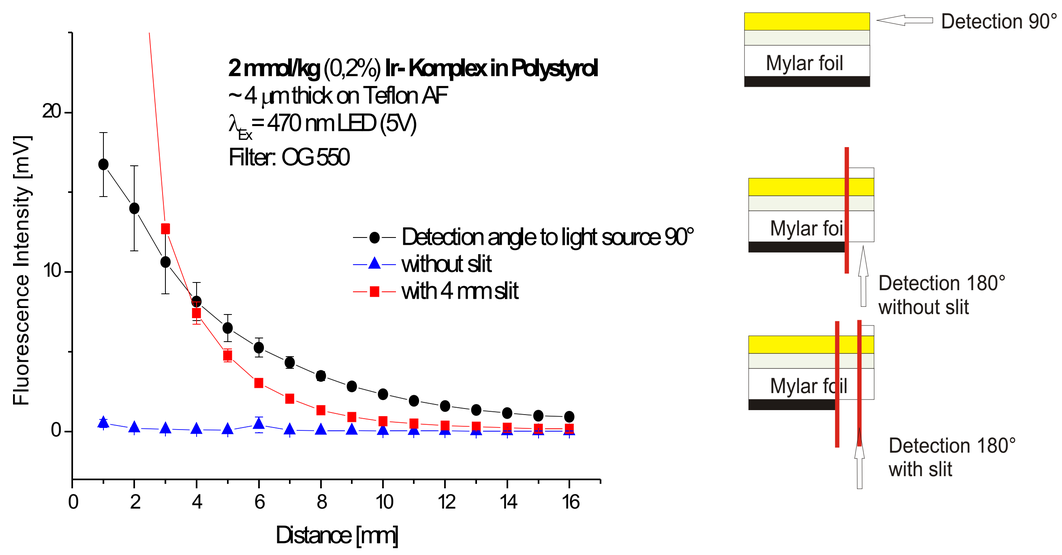


Variation of layer thickness and emitter concentration

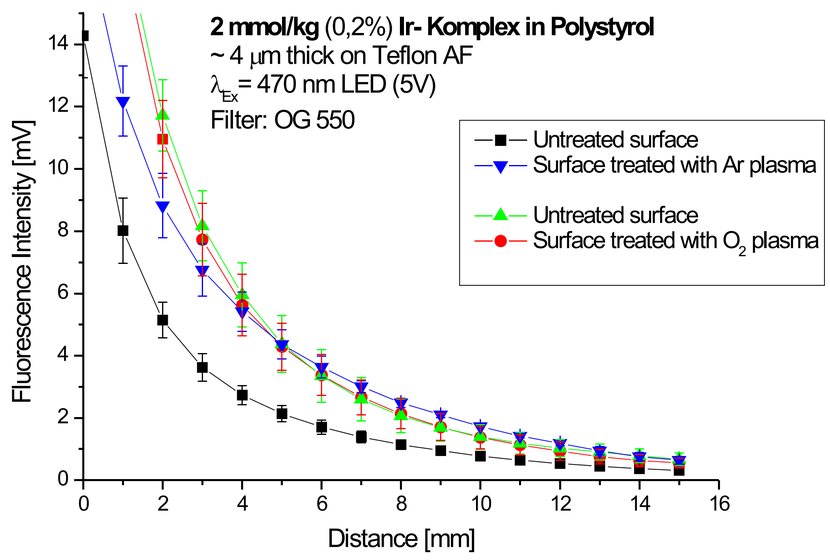




Variation of detection angle



Treatment of Teflon surface



The polymer film was treated with Ar or Oxygen plasma due to the adhesion and processing problems of the extreme hydrophobic Teflon AF layer. The figure shows, that treating the Teflon layer with Oxygen plasma doesn't have an impact on the detected signal.