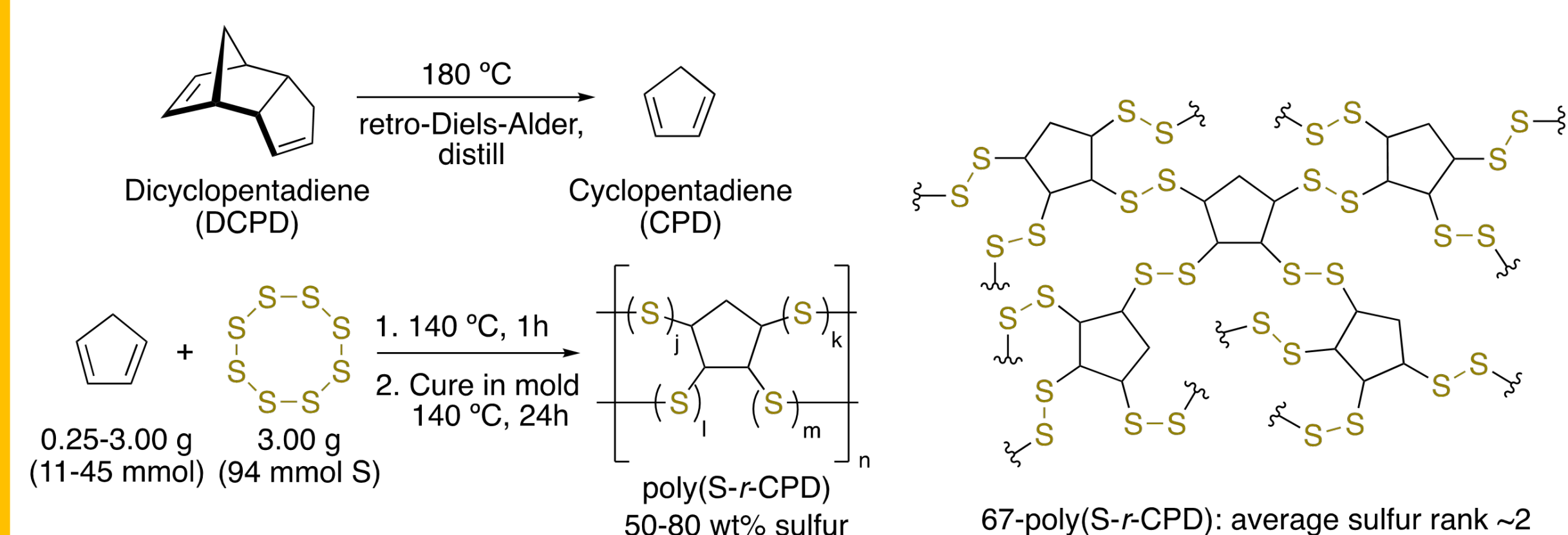
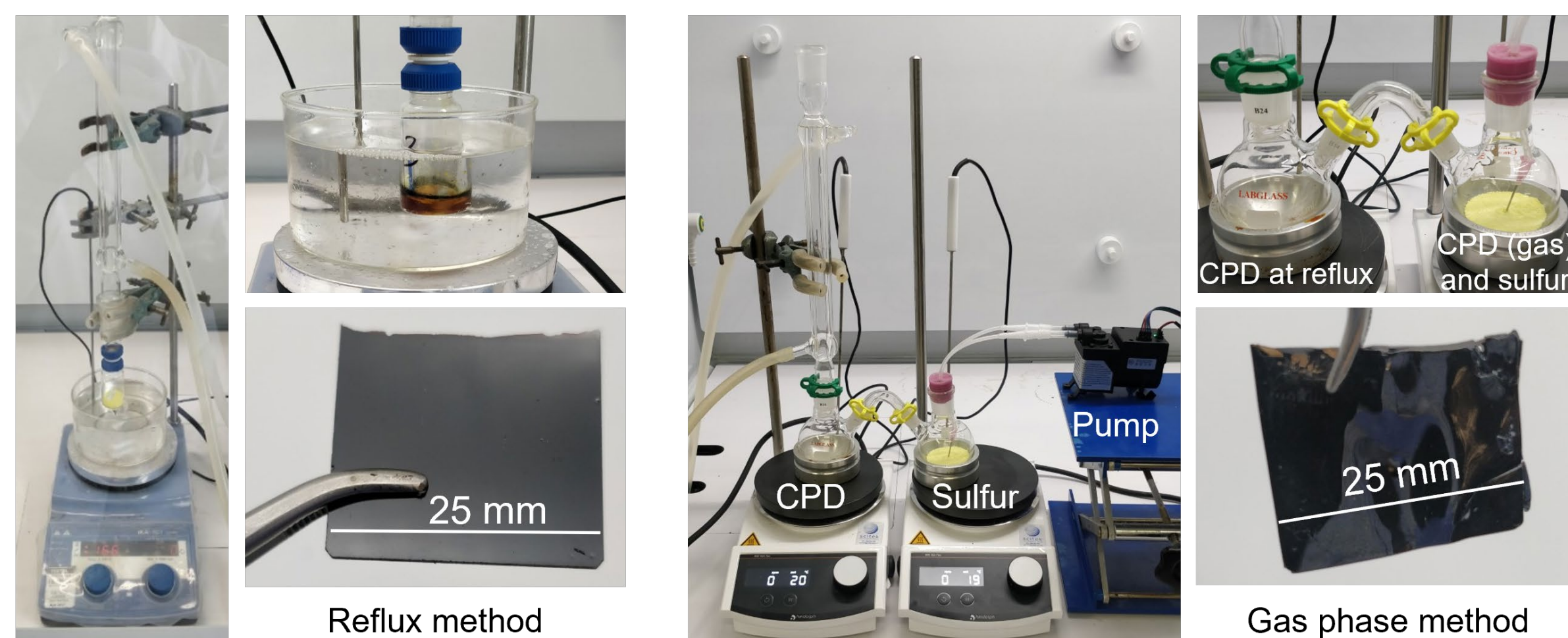


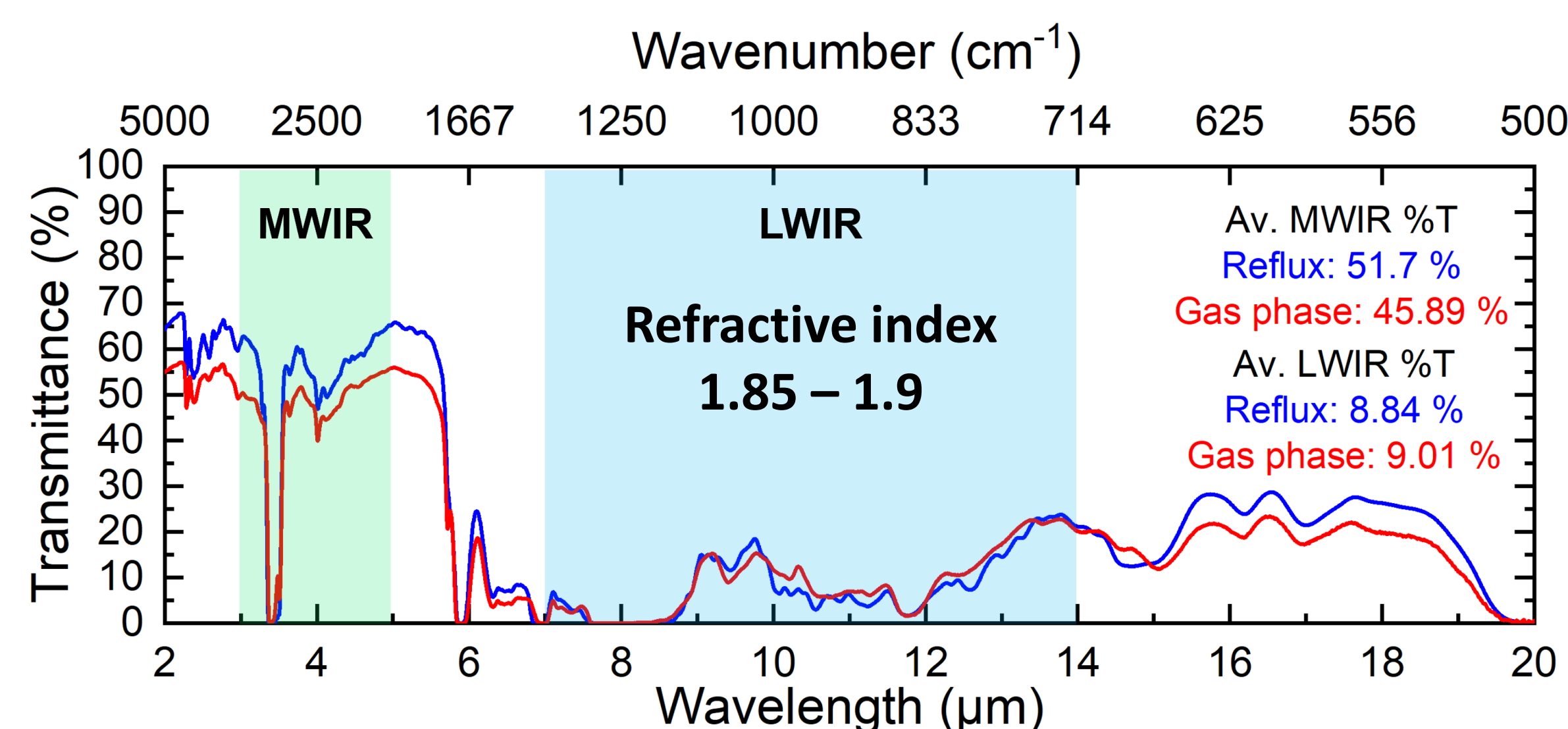
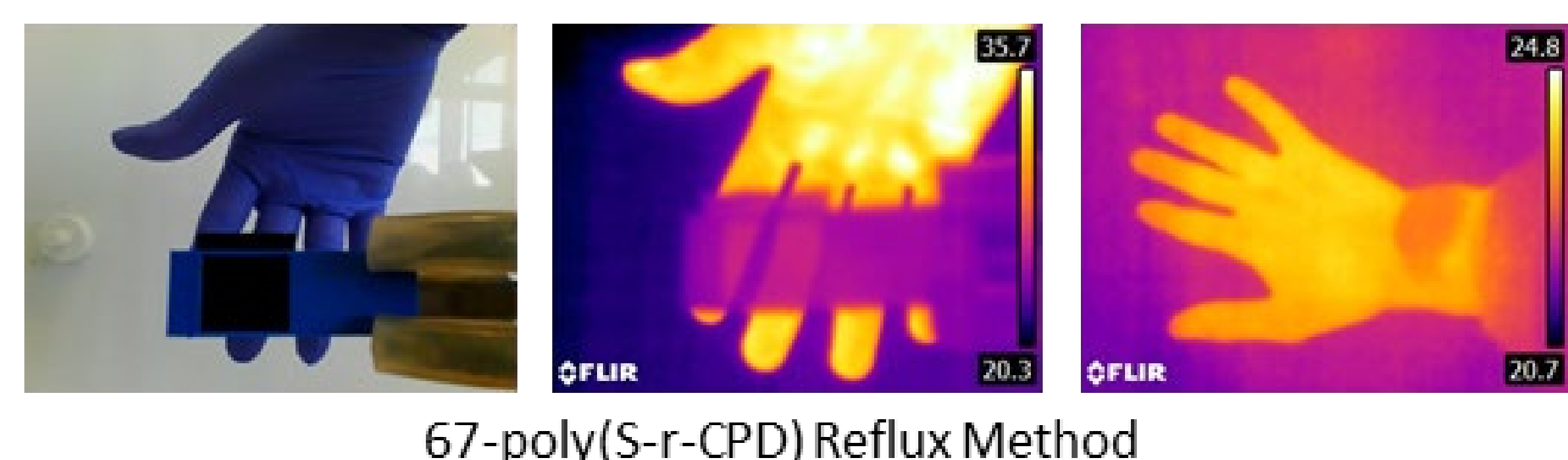
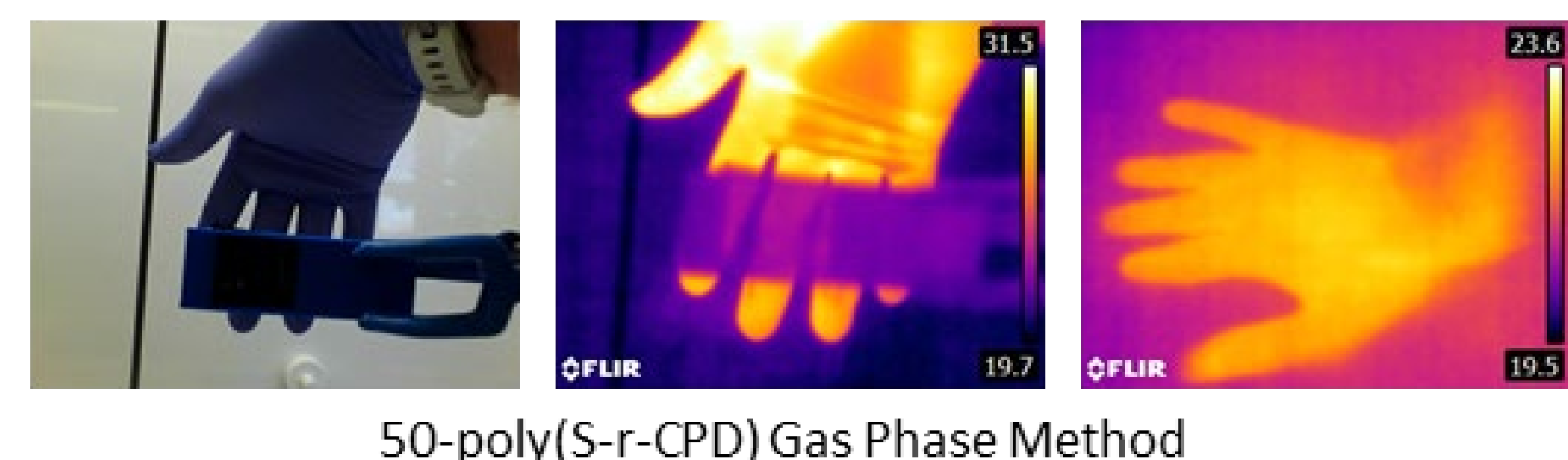
Introduction

- Thermal imaging cameras have had a significant decrease in cost in the last decade and as a result are much more accessible.
- However, the materials used for lenses and other optics like germanium and zinc selenide are extremely expensive, difficult to manufacture and in some cases can be toxic.
- We have developed sulfur based polymeric materials with significantly reduced cost and increased processability.
- First reaction of this type using a gaseous monomer with sulfur.



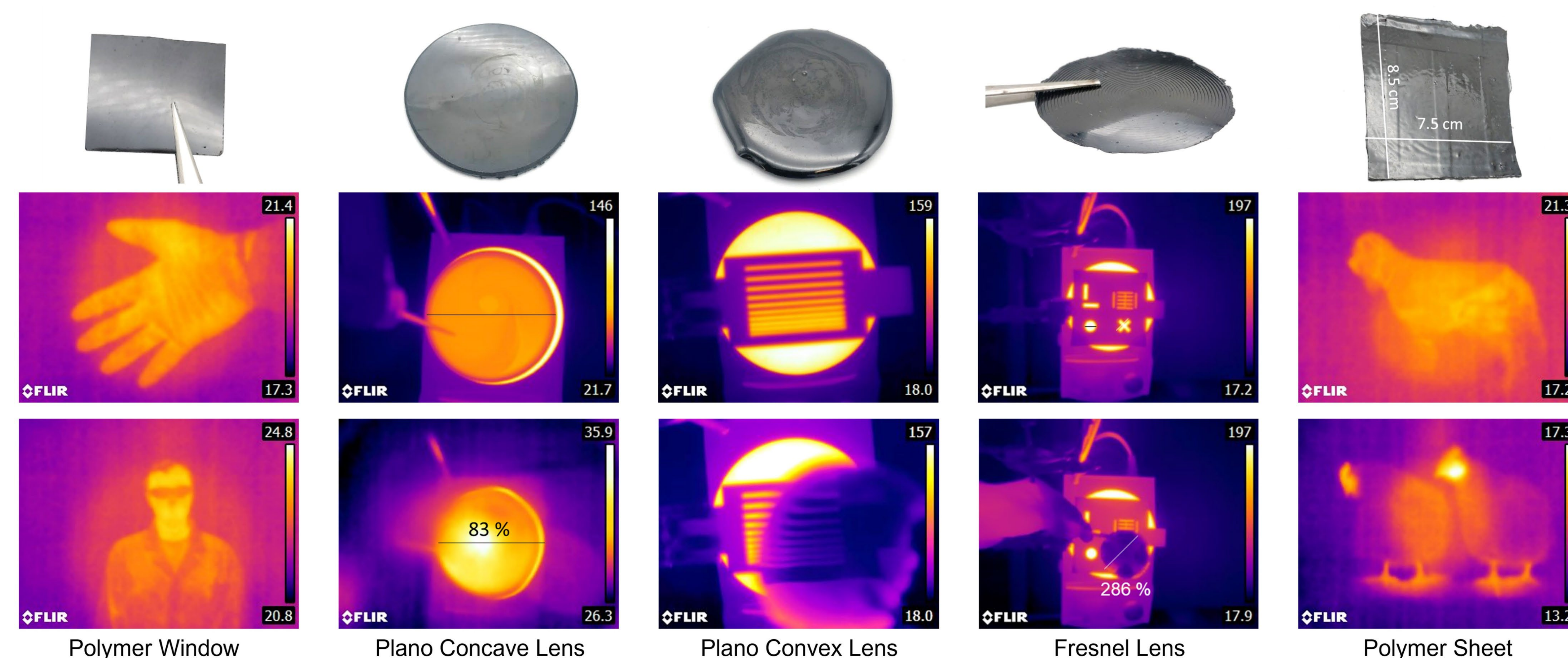
LWIR Properties

- The high sulfur content and low vibrational modes gives the highest MWIR and LWIR transmittance in literature for a >1 mm thick polymeric material and allows for high quality thermal imaging.
- We also achieved exceptional refractive index for a polymeric material, an extremely important property for use in optical devices.



Applications

- High transmission and black colour allows for use in windows and clandestine surveillance.
- High refractive index facilitates use as a lens.
- Low cost and processability gives many advantages over conventional materials.



Conclusion

- Polymeric materials were made with sulfur and first ever gaseous co-monomer.
- Materials displayed exceptional refractive index and infrared transmission. Highest average MWIR and LWIR transmission for any polymeric material.
- Application as a material for thermal imaging lenses or infrared transparent casing was demonstrated.
- Research on sulfur based polymers with high refractive index and infrared transparency is ongoing.