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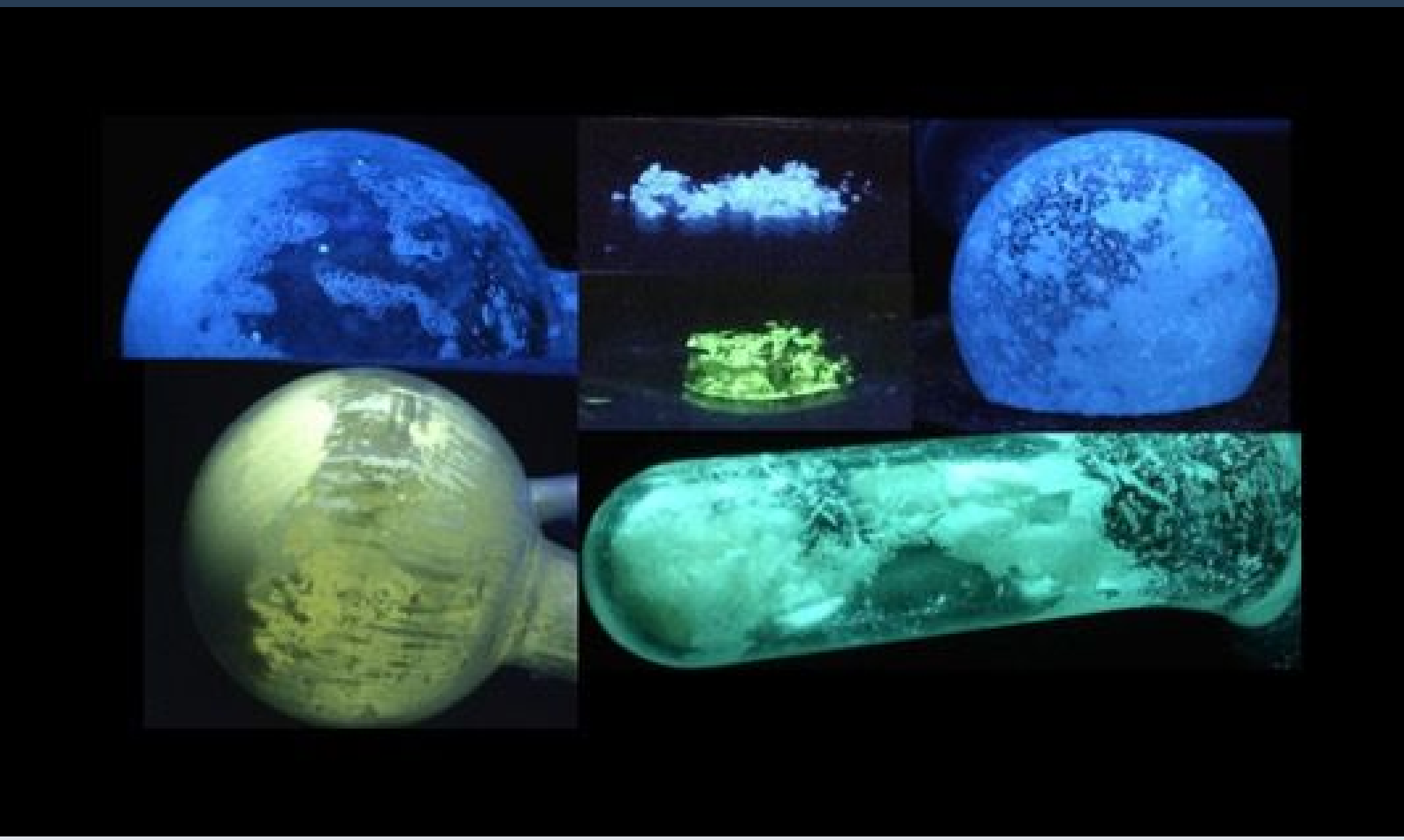
Functionalized Phosphines as AIE Luminogens

New class of structurally and coordinatively flexible easily accessible phosphine derivatives with luminescent behavior in aggregated states



Header image provided by the university

IP Status

Know-how based

Seeking

Development partner, Commercial partner

About **LMU Munich**

Ludwig-Maximilians-Universität München is the University in the heart of Munich. LMU is recognized as one of Europe's premier academic and research institutions. The LMU Munich community is engaged in generating new knowledge for the benefit of society at large.

Background

Current luminescent materials lack in their adaptability, long term stability and general optical performance, especially if there is a strive for blue emission. Common materials are hard to synthesize as they require numerous steps, expensive catalysts and tedious work-up. Often scarce and toxic metals are needed to achieve the desired optical performance. Also, aggregation-induced quenching is a major issue for applications that are not operating in dilute solution. Thus more sustainable, easily accessible and highly modifiable luminescent materials are needed for a broad range of possible applications.

Tech Overview

With a strong background in organic synthesis, the LMU Munich researchers behind this project are very experienced in the facile synthesis of functional materials. The focus lies on the generation of repeatable, scalable and widely applicable synthetic protocols achieved by simple work up routines like recrystallization or distillation, although more demanding synthetic procedures and handling of sensitive compounds are also possible. The integration of aromatic moieties is achieved in a one-step coupling process of differently hybridized carbon centers to a phosphorus center. These aromatic moieties can be easily functionalized with different substituents to achieve and tune the desired properties. To ensure the purity of the synthesized samples, multiple different analytical instruments are at hand with a main focus on multinuclear NMR spectroscopy and X-Ray analysis.

Stage of Development

Proof of Concept, *Proven Principal*, *Optimization*, *Up-Scaling (5-10 g)*, *Expansion of Target Compound Library*.

Using these synthetic and analytical procedures, a multitude of luminescent compounds with different emission wavelengths were generated so far. This provides the basis for further success in the development of superior luminescent materials in the future (Figure 1).

Benefits

- Easy and high-yielding synthesis (multigram-scale)
- Cheap starting materials
- Air and moisture insensitive compounds
- Variation of the ligand and emission spectrum e.g. via introduction of Push-Pull-Systems, π-system, steric, …
- Small-band emission possible

Applications

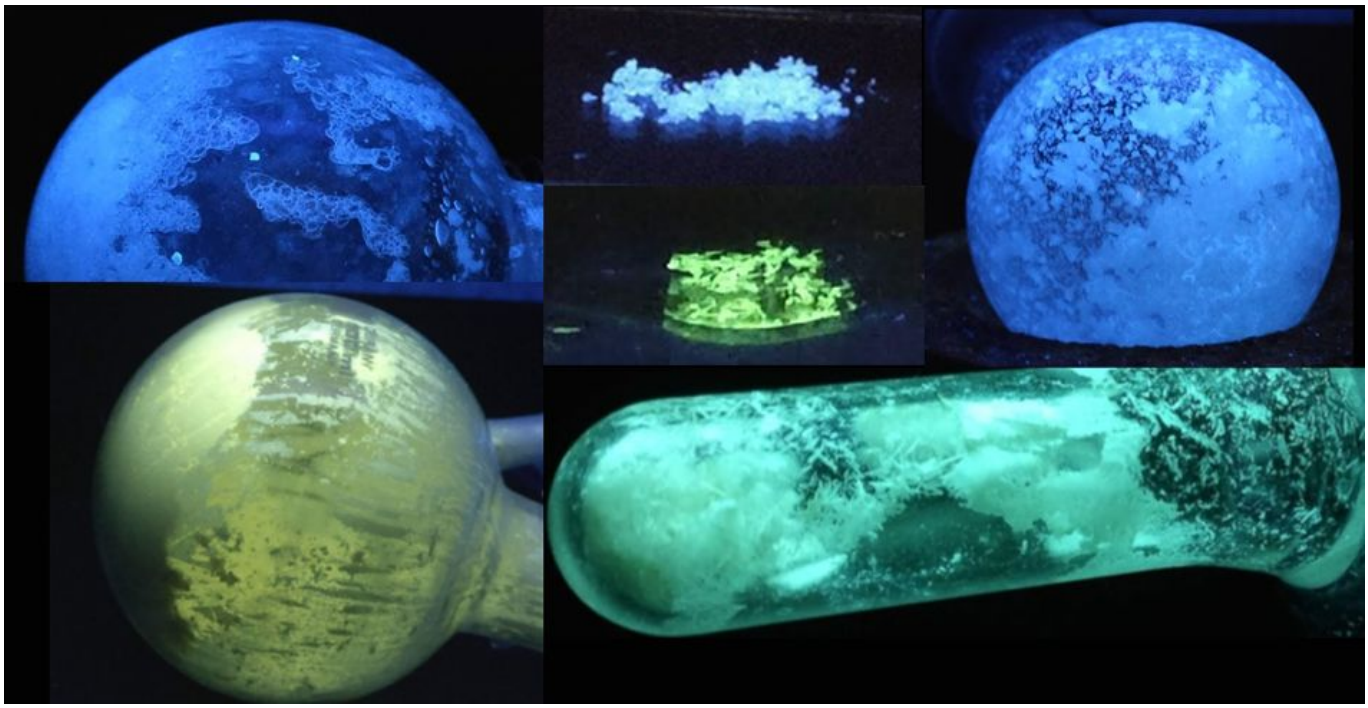
- Optoelectronic devices (OLEDs, Organic Lasers)
- Sensors
- Photocatalysis
- Bioimaging

Opportunity

Seeking development Partner, Research Partner.

Appendix 1

Figure 1



For further information, please contact us.

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