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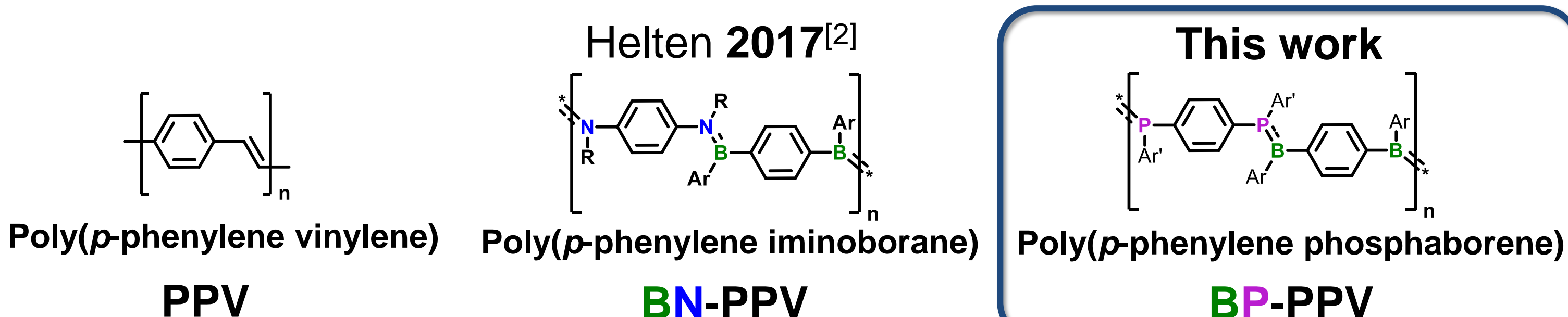
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Introduction

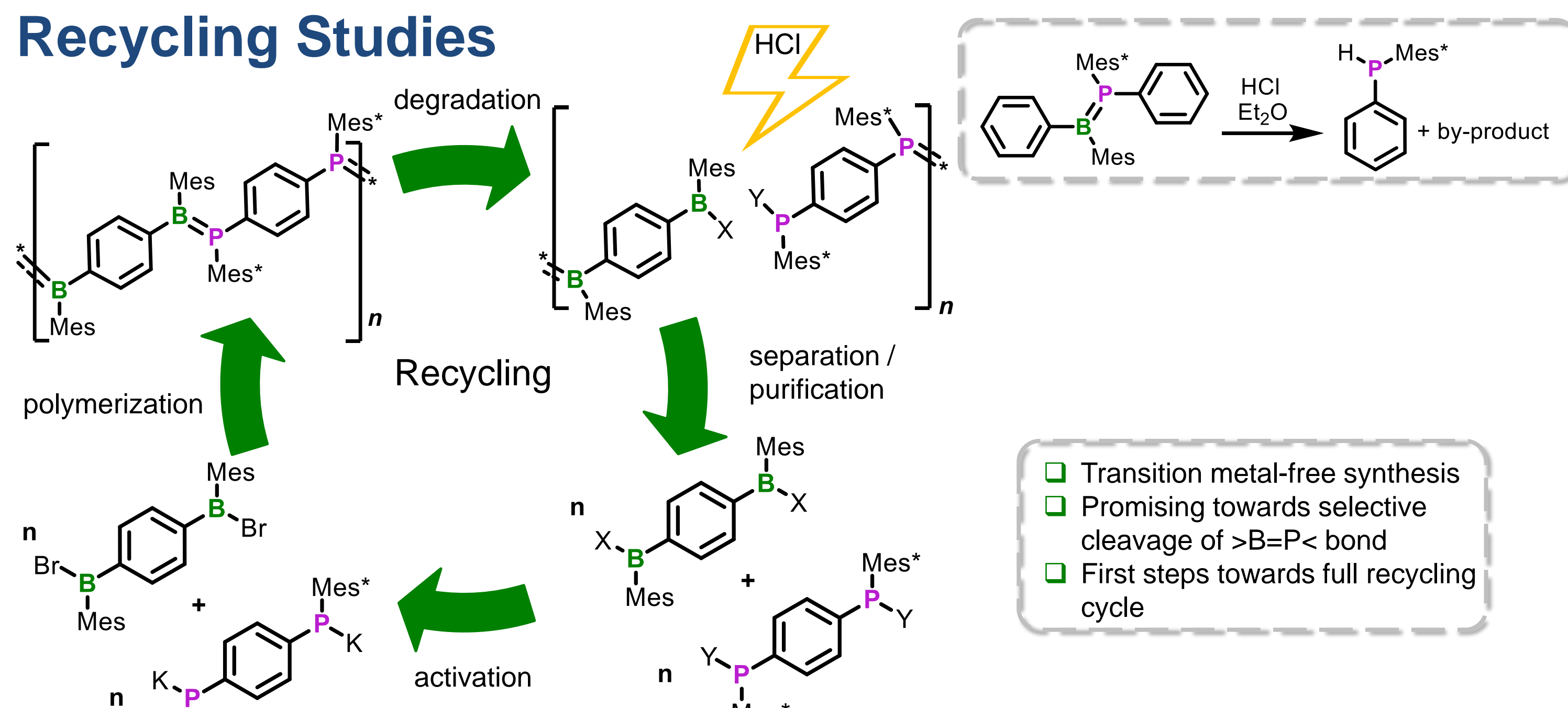
The replacement of selected C=C units in well-established π -conjugated organic materials by isosteric and isoelectronic heteroatomic units, e.g., B=N,^[1] has led to numerous novel hybrid materials, many of which show intriguing properties and functions. Our group recently presented an unprecedented BN-modified poly(*p*-phenylene vinylene) (PPV).^[2] We now aim at introducing valence isoelectronic B=P units into such PPVs.

So far, we have prepared BP-PPV-type oligomers, which exhibit a planar backbone with extended π -conjugation, and we performed several polymerization studies. The introduced B–P bond also serves as a predetermined cleavage point, which could provide the fundament for a full recycling process. We have already made first achievements towards selective degradation of these compounds.^[3]

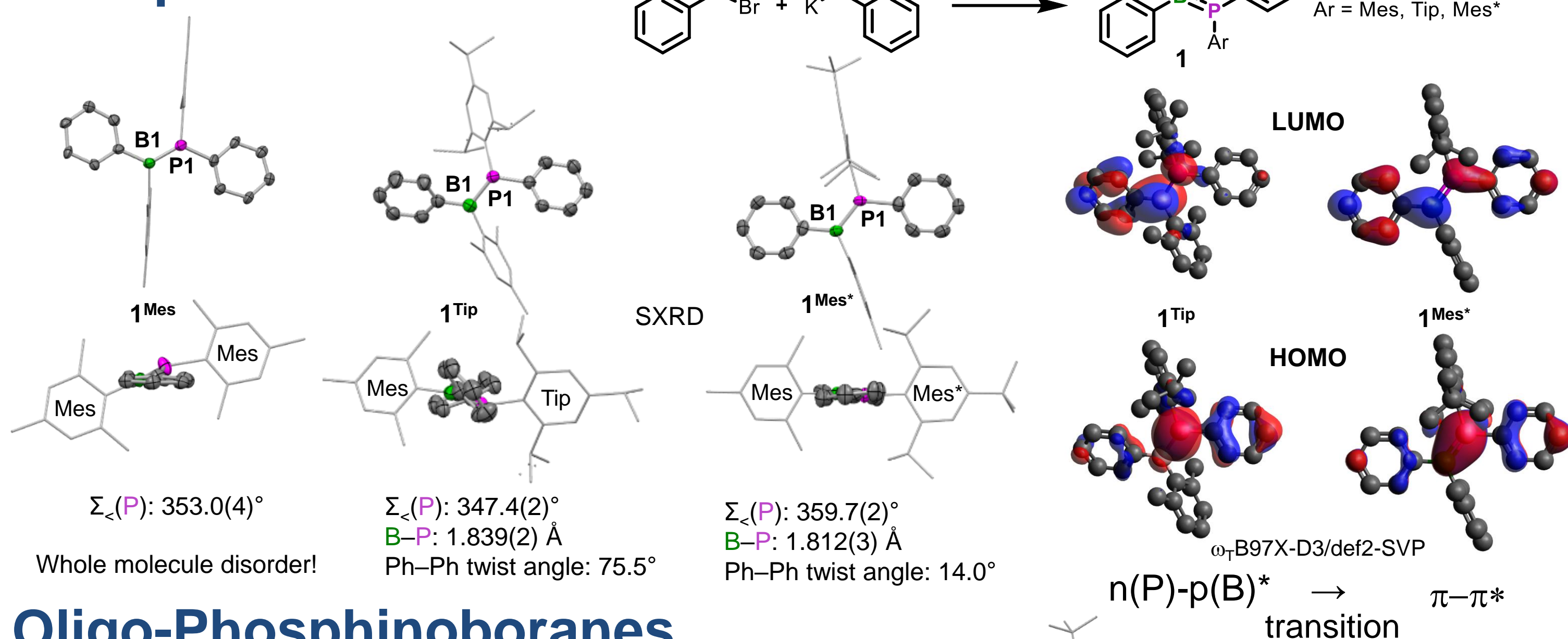
Poly(*p*-phenylene phosphaborene) – a PPV Analogue



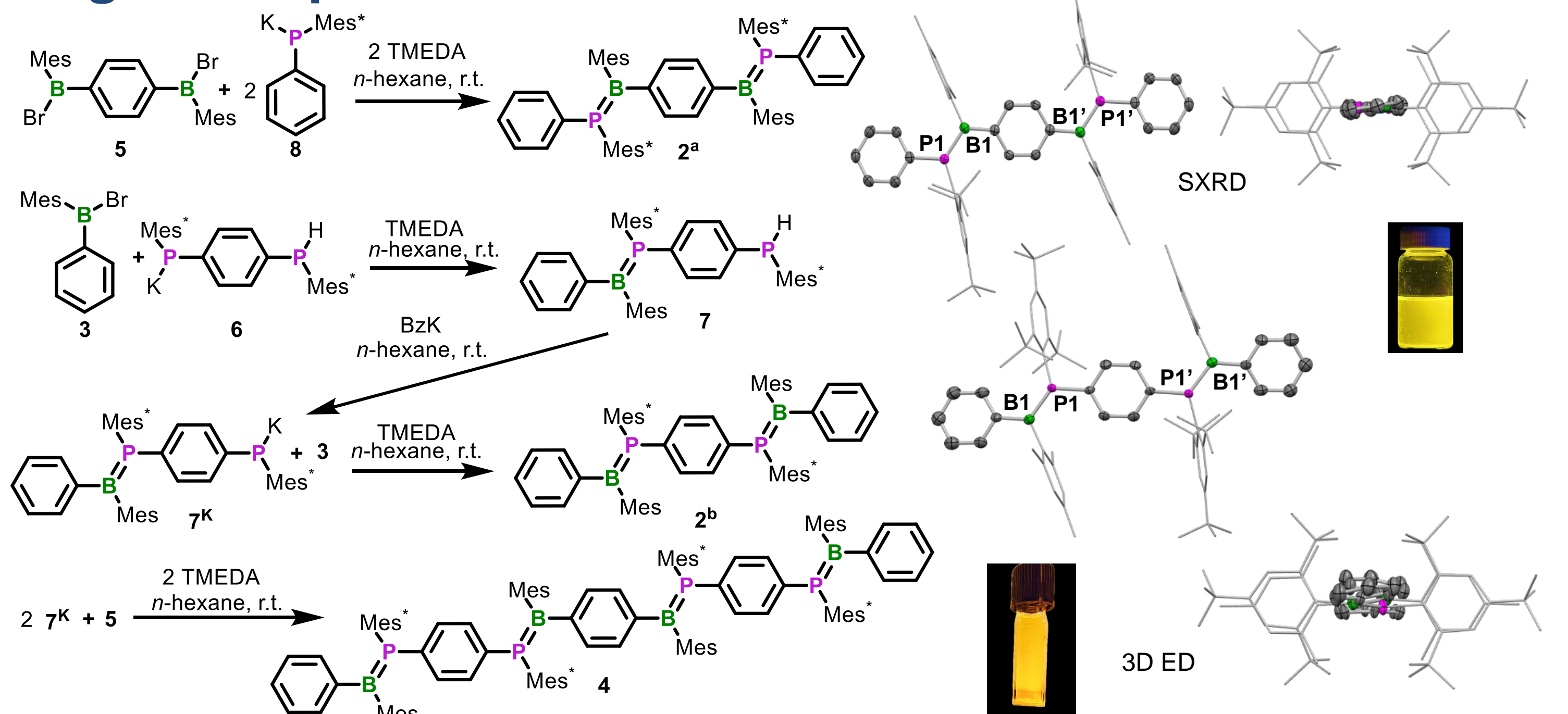
Recycling Studies



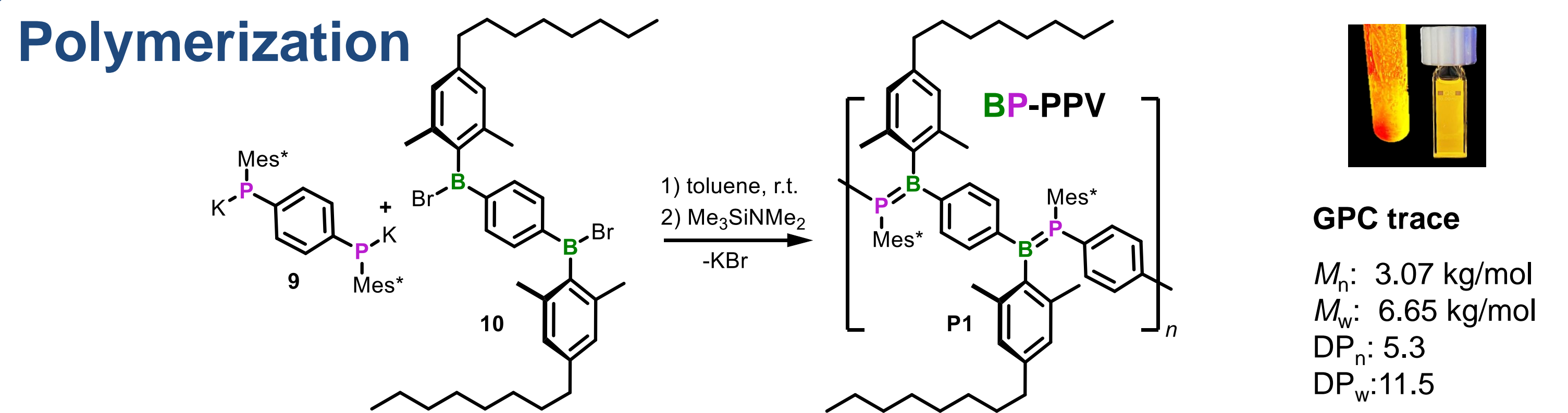
Phosphinoboranes



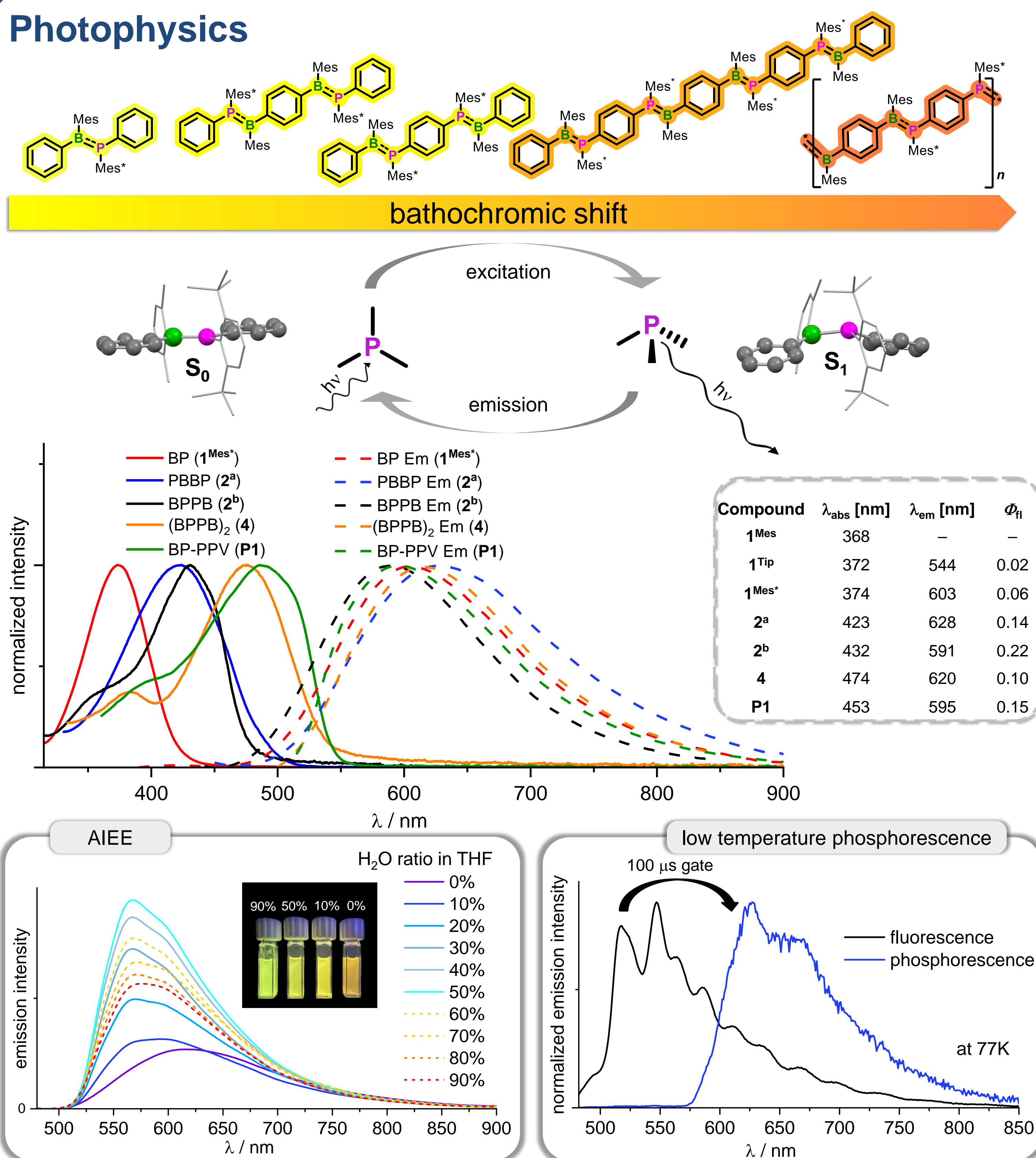
Oligo-Phosphinoboranes



Polymerization



Photophysics



Conclusion

We accomplished the synthesis of a series of oligo(*p*-phenylene phosphaborene)s, which serve as model compounds for BP analogues of PPV. These species exhibit a nearly perfect planarization of the phosphorus center, a highly planar backbone, and B–P bond lengths that indicate B=P double bond character. The $\pi-\pi^*$ absorption bands in their UV-vis spectra show a continuous redshift with increasing chain length of the oligomers. Furthermore, all oligomers and the polymer show distinct emission in solution as well as aggregation induced emission enhancement (AIEE).

Acknowledgement

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References

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- [2] a) T. Lorenz, M. Crumbach, T. Eckert, A. Lik, H. Helten, *Angew. Chem. Int. Ed.* **2017**, 56, 2780-2784; b) J. Chorbacher, J. Klopff, A. Friedrich, M. Fest, J. S. Schneider, B. Engels, H. Helten, *Angew. Chem. Int. Ed.* **2024**, e202416088. c) M. Maier, J. Chorbacher, A. Hellinger, J. Klopff, J. Günther, H. Helten, *Chem. Eur. J.* **2023**, 29, e202302767.
- [3] J. Glock, J. Klopff, M. Crumbach, J. S. Schneider, A. Friedrich, E. Buchsteiner, T. Bischof, M. Finze, B. Engels, H. Helten, *Angew. Chem. Int. Ed.* **2025**, in revision.



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