Synthesis, Crystal and Electronic Structures of a Thiophosphinoyl- and Amino-Substituted Metallated Ylide

Invited for this month’s cover is the group of Viktoria H. Gessner at the Ruhr-University in Bochum (Germany). The cover shows the structure of the newly reported, isolated metallated ylide. Due to the high negative charge at the ylidic carbon center this compound is „on fire”, but can be stabilized by smart molecular design. Structure analyses of the different alkali metal complexes combined with computational studies provide insights into the electronic structure of the compounds. Read the full text of their Communication at 10.1002/open.202100178.

In one word, how would you describe your research?
Fiery

What prompted you to investigate this topic/problem?
Our group is investigating the use of ylides as functional groups in various fields of research. Metallated ylides, such as the one presented in our manuscript, are ideal precursors. However, due to the highly reactive carbanionic site, these compounds are in general extremely reactive and thus only few metallated ylides have been isolated in the past. This lack of available reagents prompted us to expand the portfolio of easy-to-synthesize metallated ylides for future applications.

Is your current research mainly curiosity driven (fundamental) or rather applied?
All of my research projects are curiosity driven. This also applies for the more applied projects in my group on which we are working together with industrial partners. Fundamental and applied research don’t exclude but complement each other.

What other topics are you working on at the moment?
My group is working on various projects focusing on the development of carbanionic compounds and ligands for applications in main group chemistry and homogenous catalysis. In general, we are using carbanions either as active sites in bifunctional catalysts or as function groups to manipulate the electronics of an adjacent entity. With this strategy we are aiming at isolating reactive main group species with unique electronic properties or generating novel efficient homogeneous catalysts.