using tunable synchrotron photoionization mass spectrometry.

Importantly, the lifetime of the Criegee intermediate was long enough (~2 ms) to measure how this decay is affected by the addition of other species — giving direct data on the kinetics of CH_2OO reactions. Taatjes and colleagues studied reactions with NO, H_2O, SO_2 and NO_2, and found that the reactions of SO_2 and NO_2 were unexpectedly fast, suggesting that they are more important in atmospheric models than previously thought. *GA*

COORDINATION POLYMERS

Side chains chip in

J. Am. Chem. Soc. **134,** 1553–1559 (2012)

One particularly attractive feature of coordination networks — formed by metal centres, usually acting as network nodes, linked through organic ligands that serve as vertices — is their intrinsic ability to be tuned. Modification strategies typically aim to functionalize the organic vertices without affecting the coordination situation at the metal nodes, thus retaining the framework's structure. Rather than exclusively functionalizing the ligands, Zhengtao Xu and co-workers have now investigated side chains from the ligands that can also coordinate to the metal centres yet still preserve the overall network topology — and have observed a dramatic change in properties.

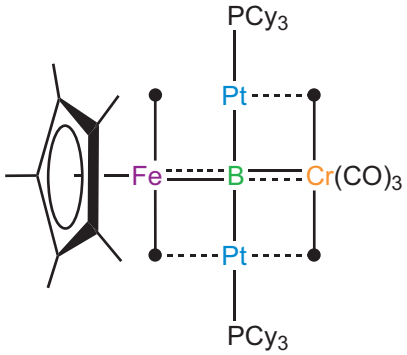
Two materials were constructed from the same lead–carboxylate chains, but with organic linkers featuring different pendant groups: either a thio or a hydroxyl moiety. Only the hydroxyl groups coordinate to the lead, and because it is able to accommodate different numbers of ligands this 'secondary group participation' only disrupted the lead–carboxylate chains in a subtle manner. This weaker coordination interaction, however, induced dramatic changes in properties: the thio-based material exhibited a yellow–green luminescence, whereas a bright white emission was observed with the hydroxyl-based one. This may partly arise from the weakening of the lead–carboxylate bonds, and its effect on electronic transfers.

A commercial ultraviolet light-emitting diode with a blue tinge was converted to a bright white-light one on coating with the hydroxyl-based material. Furthermore, the specific arrangement of the chiral hydroxyl-based side chain also conferred the network significant nonlinear optical properties. This functionalization is reminiscent of hemilabile ligands in catalysis, and points to the potential of using secondary group participation to block or free a metal site for further applications. *AP*

MAIN GROUP CHEMISTRY

Boron and flat

Angew. Chem. Int. Ed. http://doi.org/dgj5xp (2012)



The 'classical' shape of four-coordinate nitrogen, carbon and boron compounds is tetrahedral, as predicted by the valence-shell electron-pair repulsion theory that all chemists learn at an early stage. Organic chemists can use a variety of thermodynamic and kinetic methods to force carbon into unusual geometries, but inorganic chemists have a powerful trick up their sleeve: metals. Electron-rich transition metals can form π-backbonds to nitrogen, carbon or boron, which can stabilize non-tetrahedral geometries. Several examples of square-planar carbon compounds exist, but boron has so far only been forced into three-coordinate T-shaped planar geometries.

Now, Holger Braunschweig and colleagues from the University of Würzburg have made a compound where a four-coordinate boron centre is roughly planar. Starting from a linear iron–boron–chromium compound, they added two platinum phosphine compounds that formed the other two points of the square. The linear core is retained in the resulting compound and the two platinum groups are slightly bent out of the plane. The team also made a roughly square-planar boron compound with a linear manganese–boron–manganese core, with platinum and gold units also present.

Braunschweig and colleagues considered the bonding using simple valence-bonding ideas and decided a neutral boron atom datively bonding to a neutral chromium atom was a better description than a dianionic borylene ligand, because the former obeys the octet rule. Most remarkably, with no stiff bridging ligands, neither compound is considered to be under strain. *NW*

Written by Gavin Armstrong, Stuart Cantrill, Stephen Davey, Anne Pichon and Neil Withers.

blogroll

For safety's sake

Learning from a tragedy, and forthright feedback.

Although the death of Sheri Sangji after an accident at UCLA was more than three years ago, it continues to generate interest, especially when news broke that UCLA and her PI Professor Patrick Harran were being charged for felony violations of labour laws. For continuing excellent coverage of this, read *C&ENtral Science*'s The Safety Zone by Jyllian Kemsley (http://go.nature.com/rEvMq8 for example). Kemsley regularly rounds up news and blog discussion about the case, so The Safety Zone is a great place to start finding out what people think about it.

Matt Hartings at ScienceGeist (http://go.nature.com/7WVvpL) took a different tack to many of the bloggers discussing the specifics of the case, and the possibility that Harran may face jail. Hartings, an assistant professor at American University and thus responsible for training students in the lab, put forward some ideas for how safety training could be improved. Following on from ChemBark's suggestion of incorporating safety into weekly group meetings (http://go.nature.com/YTw8n7), Hartings proposes that these could be held at the start of the week. That way, new reactions could be discussed before they were performed, forcing individual group members to "assess the safety of any new procedure". Furthermore, everyone else present in the lab "will be made aware of when any hazardous protocols will be in use". Regardless of personal views on the specific advice, it is good to see lessons being learnt and safety being discussed seriously.

And finally...ratemyprofessor.com is probably already famous — or infamous — among some of our readers, but we recently learnt of BerateMyProfessor (http://beratemyprofessor.blogspot.com). This contains some student evaluations from the anonymous blogger's "ten years of teaching general and organic chemistry". There are some forthright views from all those students, especially when it comes to their professor's 'attempts' at humour — and dress sense!