

New salts for chemical soups

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Organozinc reagents are an important class of organometallic compounds with a wide range of applications. German chemists have developed a novel route for the synthesis of so-called organozinc pivalates in a stable powdered form. They promise to be extremely useful in many industrial contexts.

In order to meet future demands for new pharmaceuticals, innovative materials and [agricultural pesticides](#), the chemical industry is dependent on the ongoing development of effective methods for the synthesis of complex [organic compounds](#). Because they are so versatile, organometallic molecules are of special significance in this context. Among these, reagents containing zinc atoms have certain advantages over the corresponding organolithium or -magnesium compounds, as they are compatible with a broader array of [functional groups](#).

Ludwig-Maximilians-Universität München chemists led by Professor Paul Knochel have now developed a simple "one-pot" method for the economical synthesis of organozinc pivalates. Up until now, such functionalized organozinc compounds were only available in liquid form, and were difficult to transport and store due to their susceptibility to degradation upon contact with air or moisture. The new synthetic route permits their formation as salt-stabilized solids, which can easily be recovered in powder form. "In this form, the reagents can be stored in an argon atmosphere for months without loss of activity," says Knochel. "They can even be exposed to air for short periods without risk of degradation or ignition."

One of the most prominent applications for organozinc reagents is their use for the so-called Negishi cross-coupling, a type of reaction that provides a simple means of linking [carbon atoms](#) together in a virtually unlimited variety of ways, and earned its discoverer a share of the Nobel Prize for Chemistry in 2010. "The new class of organozinc pivalates makes it possible to employ different solvents in the Negishi cross-coupling reaction and greatly extends the spectrum of coupling partners it can be applied to," says Sebastian Bernhardt, who is the lead author on the new study. "The new [reagents](#) contain magnesium salts, which also facilitate the addition of organozinc pivalates to carbonyl groups." This opens the way to their use for a whole series of applications relevant to the industrial manufacture of fine chemicals. The new scheme for synthesis of these [compounds](#) is the subject of an international patent application. (suwe)

More information: Preparation of Solid Salt-Stabilized Functionalized Organozinc Compounds and their Application to Cross-Coupling and Carbonyl Addition Reactions

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