



MS spectroscopy: a powerful tool for organometallic intermediate identification?

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Our group is interested in the preparation, reactivity and use of organometallic reagents in organic synthesis. These reagents generally require drastic conditions, in particular anhydrous conditions and temperature control to guarantee their stability. Identifying these key intermediates remains a major challenge for understanding the reaction mechanisms involved.

Because Mass Spectroscopy is a powerful method for identifying complex species, including trace amounts in a medium, we focus our attention on the development of a MS method for the characterization of organometallic intermediates. The main advantage of MS for this type of challenge is that analysis and acquisition times is shorter than with NMR, commonly used to identify organometallic intermediates. MS also allows the reaction medium to be analyzed in conventional solvent, and does not require expensive deuterated solvents. However, several difficulties may be encountered during this study, mainly due to the sensitivity of organometallic derivatives to temperature (problem for the ionization step) and humidity (need to work under an inert atmosphere).

We chose organomagnesium (Grignard reagents) and organolithium derivatives as models to explore the feasibility of such a MS characterization method. The results and difficulties encountered during this study will be presented and discussed.

