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MICROWAVE-ENHANCED CATALYTIC HYDROGENATIONS AT MEDIUM PRESSURE

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The newly constructed reactor for hydrogenations in microwave fields allows syntheses up to 25 bar and 200 °C. This will be shown for the synthesis of intermediates of potential drugs. The following reactions were carried out: dearomatization [1], debenzylation [1], azide hydrogenation [1], the hydrogenation of C-C-double bonds [1,2], the hydrogenation of C-C-triple bonds to C-C-double bonds and the hydrogenation of nitriles and nitro compounds to amines [2]. Shorter reaction times and often better yields were achieved in the microwave in comparison to classical hydrogenations.

Beside temperature and pressure which are the main parameters determining the yield and the reaction time there are three additional main effects in the microwave field. These are the interactions of microwave irradiation with (i) polar solvents and the substrate (ii) the metal particles of the catalyst and (iii) the hydrogen bound to the catalyst's surface, respectively [3]. This is the reason why the reaction time in all investigated syntheses is substantially shorter as under the classical conditions.

References

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[2] E. Heller, et al. unpublished.
[3] A. Loupy, Ed.; *Microwaves in Organic Synthesis*, Wiley-VCH, Weinheim **2002**; J. P. Tierney, P. Lidström, Ed.; *Microwave Assisted Organic Synthesis*, Blackwell Publishing Ltd., Oxford **2005**.