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Pd-catalyzed Reductions in Deep Eutectic Solvents by Using Aluminum and Water as Hydrogen Source

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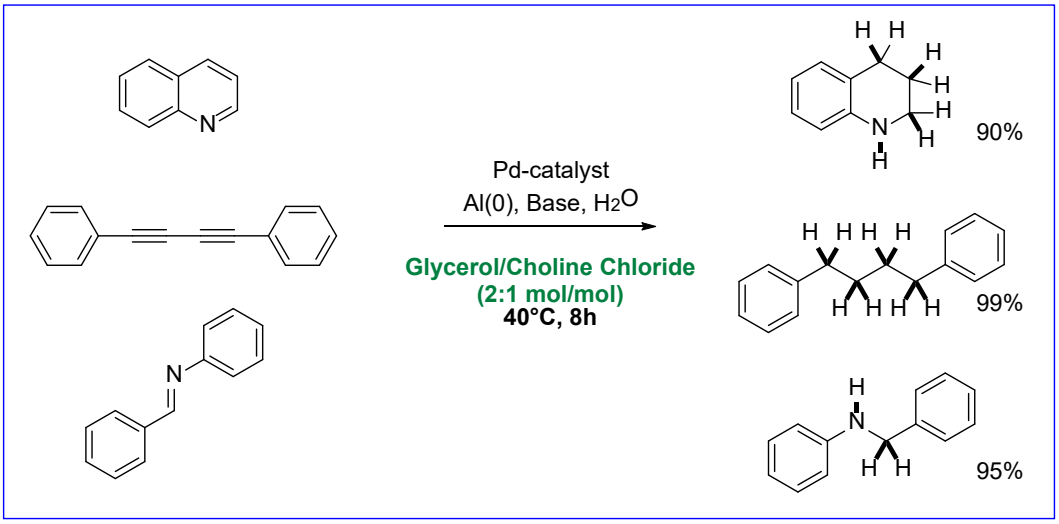
The reduction of organic functional groups, using metal-catalyzed hydrogenations, is one of the most employed strategy in organic chemistry for the synthesis of both fine and bulk chemicals.[1] Hydrogen is an explosive gas and its production needs extensive energy and generates a considerable amount of carbon dioxide. Therefore, the development of cost-effective reduction methods that use safe reagents, environmentally-friendly solvents and prevent or minimize waste formation represents a challenge of great interest in sustainable chemistry. As part of our ongoing efforts in the discovery of sustainable synthetic methodologies,[2] an alternative and safe palladium-catalyzed hydrogenation reaction in Deep Eutectic Solvents (DESs) is here described.[3] The use of aluminum powder in combination with water and a base in DESs, results in an environmentally-responsible system for the controlled *in-situ* generation of hydrogen. Our optimized protocol is effective for the reduction of a wide range of functional groups, containing C–C, C–N, C–O, N–O multiple bonds as well as for the dearomatization of (hetero)aromatic compounds, and leads to the desired products in yield up-to 99%. The simplicity, cost, tunability, scalability and the environmentally benign character of both catalytic system and DESs, offer numerous advantages over the currently available methods that employ external and dangerous H_2 source and harsh, volatile organic solvents.



[1] M. B. Smith, J. March, March's Advanced Organic Chemistry, *Wiley*, Hoboken, NJ, 6th edn, **2007**.
[2] a) G. Dilauro, S. M. García, D. Tagarelli, P. Vitale, F. M. Perna, V. Capriati, *ChemSusChem* **2018**, *11*, 3495; b) F. Messa, G. Dilauro, F. M. Perna, P. Vitale, V. Capriati, A. Salomone, *ChemCatChem* **2020**, *12*, 1979; c) G. Dilauro, C. S. Azzollini, P. Vitale, A. Salomone, F. M. Perna, V. Capriati, *Angew. Chem. Int. Ed.*, **2021**, *60*, 10632.
[3] a) C. Schäfer, C. J. Ellstrom, H. Cho, B. Török, *Green. Chem.*, **2017**, *19*, 1230; b) H. Cho, C. Schäfer, B. Török, *Curr. Org.*, **2016**, *13*, 255.

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