Strategy for selective reductive addition

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Herein we present the concept of using carbon monoxide for atom economical reductive addition without external hydrogen source [1-9]. Following this concept we have shown that N-H and C-H bonds of the reagents could be used as hydrogen source (Figure 1). The process proceeds with high selectivity. Such approach can widely use for synthesis of heterocycles.

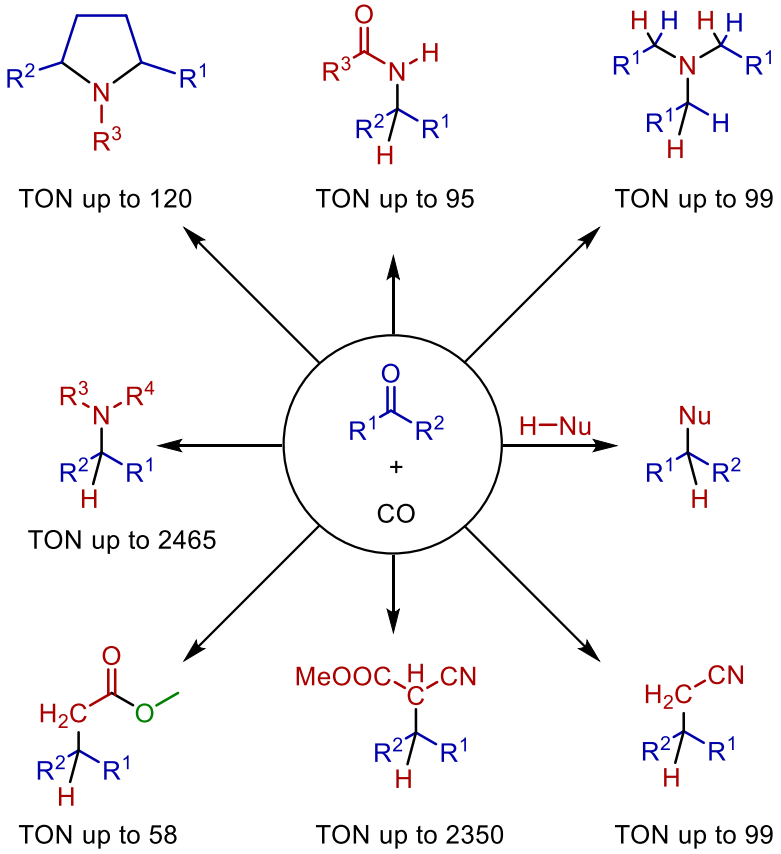

Figure 1.

1. D. Chusov, B. List, *Angew. Chem. Int. Ed.*, **2014**, 53, 5199-5201.
2. P.N. Kolesnikov, N.Z. Yagafarov, D.L. Usanov, E.A. Barablina, V.I. Maleev, D. Chusov, *Org. Lett.*, **2014**, *16*, 19, 5068–5071.
3. P.N. Kolesnikov, N.Z. Yagafarov, D.L. Usanov, V.I. Maleev, D. Chusov, *Org. Lett.*, **2015**, *17*, 2, 173–175.
4. N.Z. Yagafarov, D.L. Usanov, A.P. Moskovets, N.D. Kagramanov, V.I. Maleev, D. Chusov. *ChemCatChem*, **2015**, *7*, 2590–2593
5. N.Z. Yagafarov, P.N. Kolesnikov, D.L. Usanov, V.V. Novikov, Y.V. Nelyubina, D. Chusov *Chem. Commun.*, **2016**, *52*, 1397-1400
6. O.I. Afanasyev, A.A. Tsygankov, D.L. Usanov, D.S. Perekalin, N.V. Shvydkiy, V.I. Maleev, A.R. Kudinov, D. Chusov *ACS Catal.*, **2016**, *6*, 3, 2043–2046
7. N.V. Shvydkiy, E.A. Trifonova, A.M. Shved, Y.V. Nelyubina, D. Chusov, D.S. Perekalin, A.R. Kudinov *Organometallics*, **2016**, *35*, 17, 3025–3031
8. O.I. Afanasyev, A.A. Tsygankov, D.L. Usanov, D. Chusov *Org. Lett.*, **2016**, *18*, 22, 5968–5970.
9. P.N. Kolesnikov, K.M. Muratov, D.L. Usanov, D. Chusov, *Org. Lett.*, **2017**, *19*, 20, 5657–5660.