Supplementary Material (ESI) for Green Chemistry

Green Chemistry Tools to Influence a Medicinal Chemistry and Research Chemistry Based Organisation

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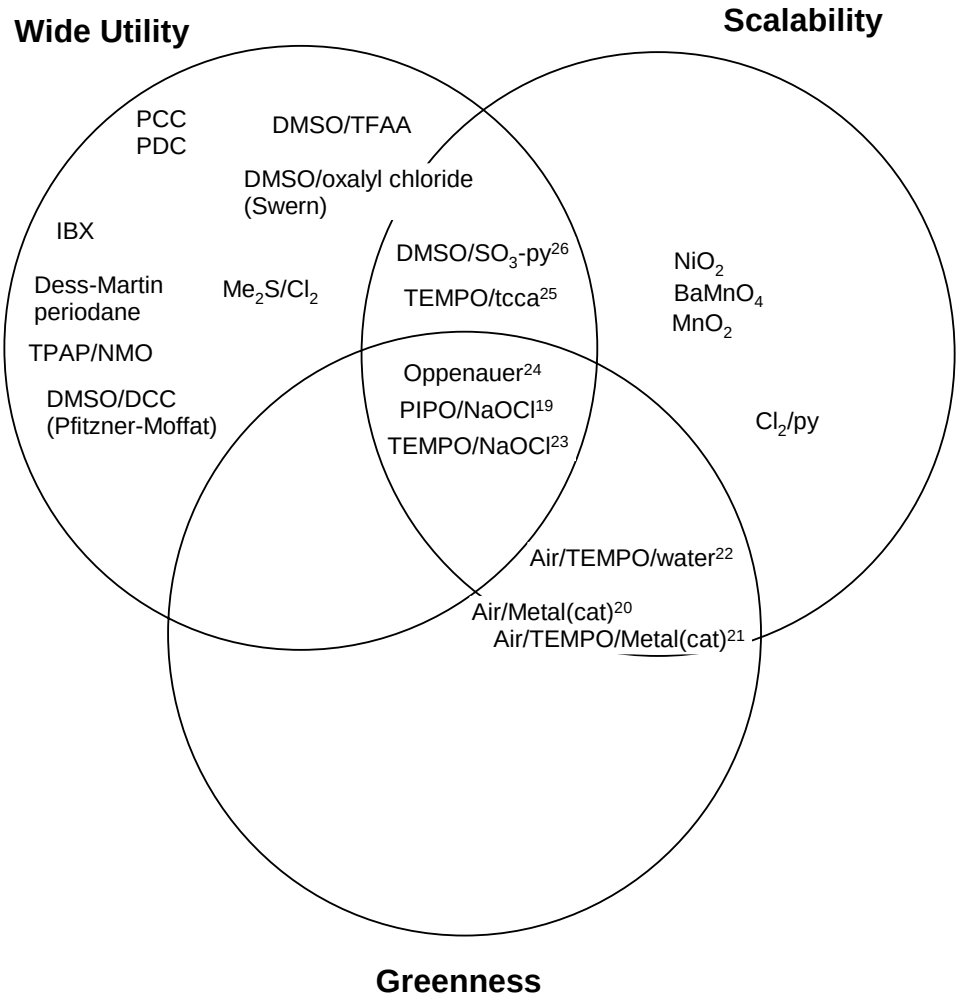
Supplementary Information

Grid 3 Oxidation of Secondary Alcohols to Ketones

Grid 3 looks very similar to Grid 1. The main differences are that nitroxyl radical/bleach based oxidations are less effective for the oxidation of secondary alcohols (indeed one of the distinguishing features of the TEMPO based methodologies is its capability for the selective oxidation of primary alcohols in the presence of secondary alcohols).[46] Fortunately a useful green oxidation for this transformation is the Oppenauer oxidation. First discovered in 1937, the Oppeneur oxidation has fallen out of favour and many chemists see this as old fashioned compared with newer oxidants. However the reaction is very Green and uses only catalytical amounts of $Al(OBu^t)_3$ or $Al(O^iPr)_3$ as base and isopropanol is the only by-product. It is hoped that an increased focus on Green synthetic methods will bring about a rebirth of interest in the Oppenauer oxidation.[47]

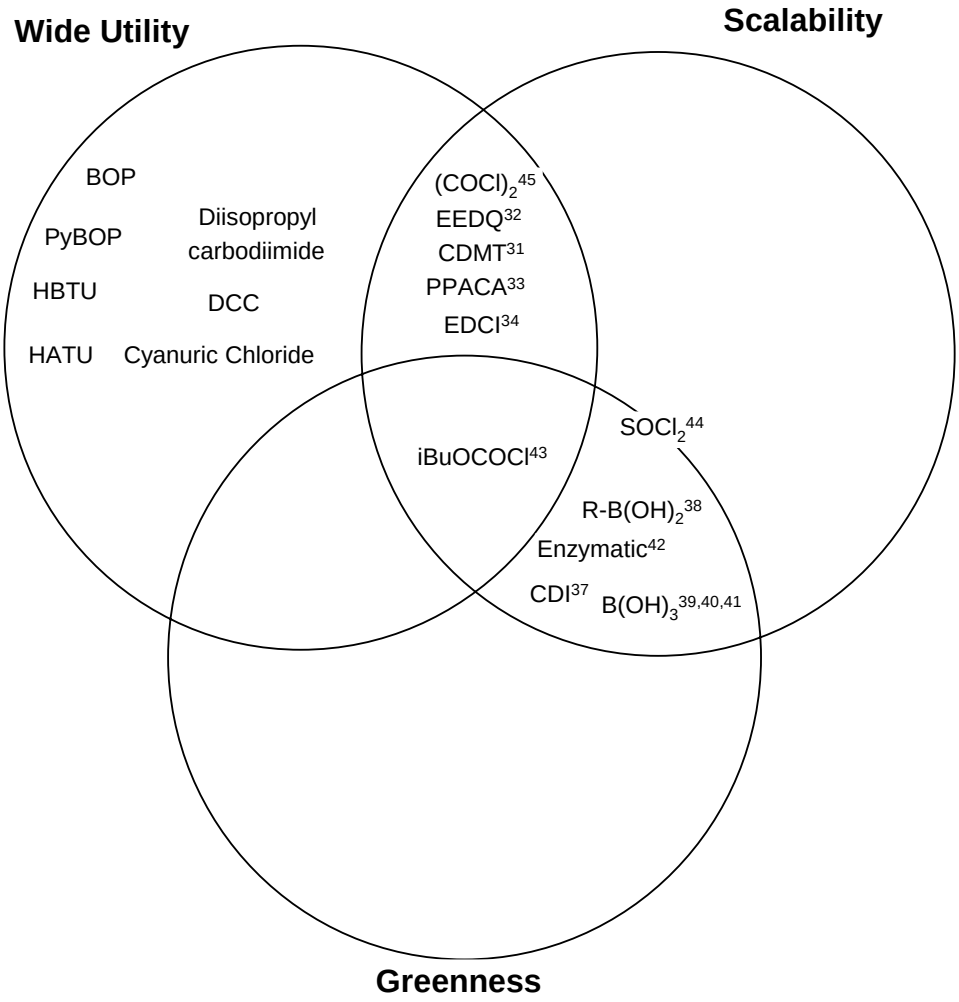
Grid 3 : Oxidation of secondary Alcohols to Ketones



Grid 4 : Amide Formation from Acids (prone to racemisation) and Amines

This grid is very similar to grid 3 except reagents like CDI and thionyl chloride cause racemisation and hence no longer meet the wide utility criteria. Isobutyl chloroformate or other chloroformates are the most commonly used reagents for this transformation on a large scale.[43] EDCI is widely used in medicinal chemistry and early development and is very suitable for use in those circumstances.

Grid 4 : Amide Formation from Acids (prone to racemisation) and Amines



References

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47. C. F. de Graauw, J.A. Peters, H. van Bekkum and J. Huskens, *Synth.,* 1994, 1007-1017; C.R. Graves, E.J. Campbell and S.T. Nguyen, *Tetrahedron Asymmetry*, 2005, **16**, 3460-3468; W. Stampfer, B. Kosjel, C. Moitzi, W. Kroutil and K. Faber, *Angew. Chem. Int. Ed.* 2002, **41**, 1014-1017.