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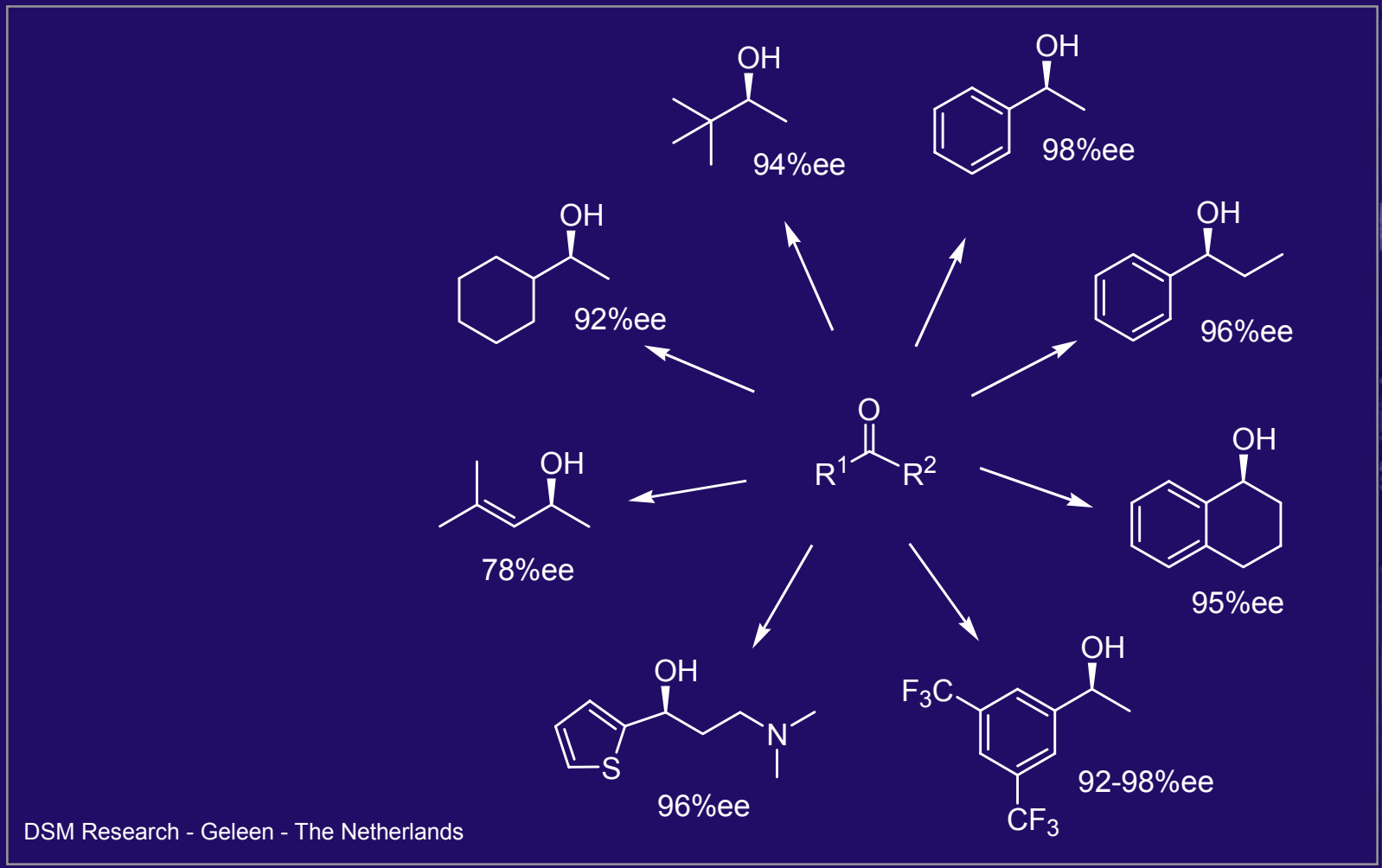
Ruthenium catalysed asymmetric reduction of ketones



DSM Research - Geleen - The Netherlands

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Proprietary DSM technology for Ketone Reductions

- Hydrogenation
  - Ru/Bisphosphine/Aux. Ligand systems
    - Phosphines licensed from Penn State University (BICP, Pennphos).
    - New, proprietary catalyst systems give great results.
  - Ru/Phosphoramidite systems
    - Cost-effective ligands give good selectivities.
- Transfer Hydrogenation
  - Ir-catalyzed system employs amino-thioethers as ligands.
- Dynamic Kinetic Resolutions (DKR)
  - Mixed homogeneous catalyst/enzymatic resolution converts 100% of a racemic ketone to the enantiopure alcohol.
    - Resolutions don't have to waste 50% of the material.
    - Extremely mild conditions.