

COD – the promising source for diverse cage-divergent cores

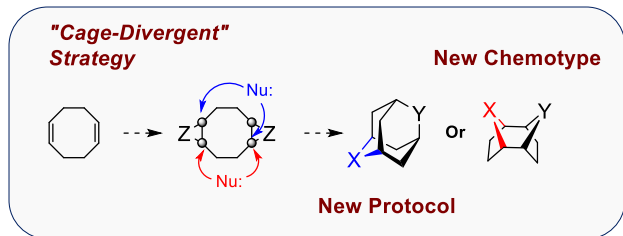
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Concept of the Project

A Divergent Approach to COD Modificationn¹ (Results):

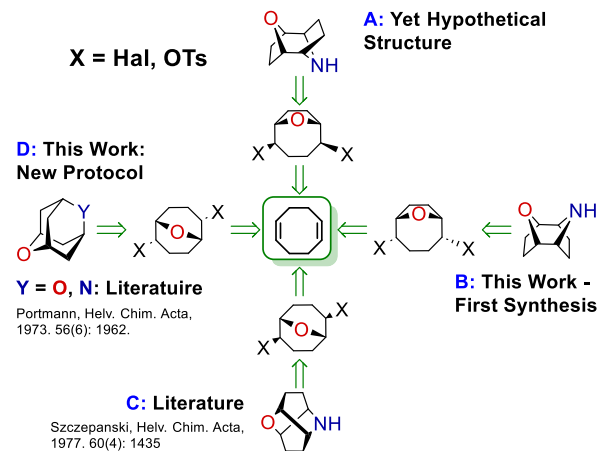
- Novel morpholine mimetics;
- Optimized COD transformations;
- Greener, safer reagents used;
- Improved bis-hetAd protocols;



The Reactor Cascade Build and

Retrosynthetic Analysis of C₈ Heteroatom-Dopped Cages:

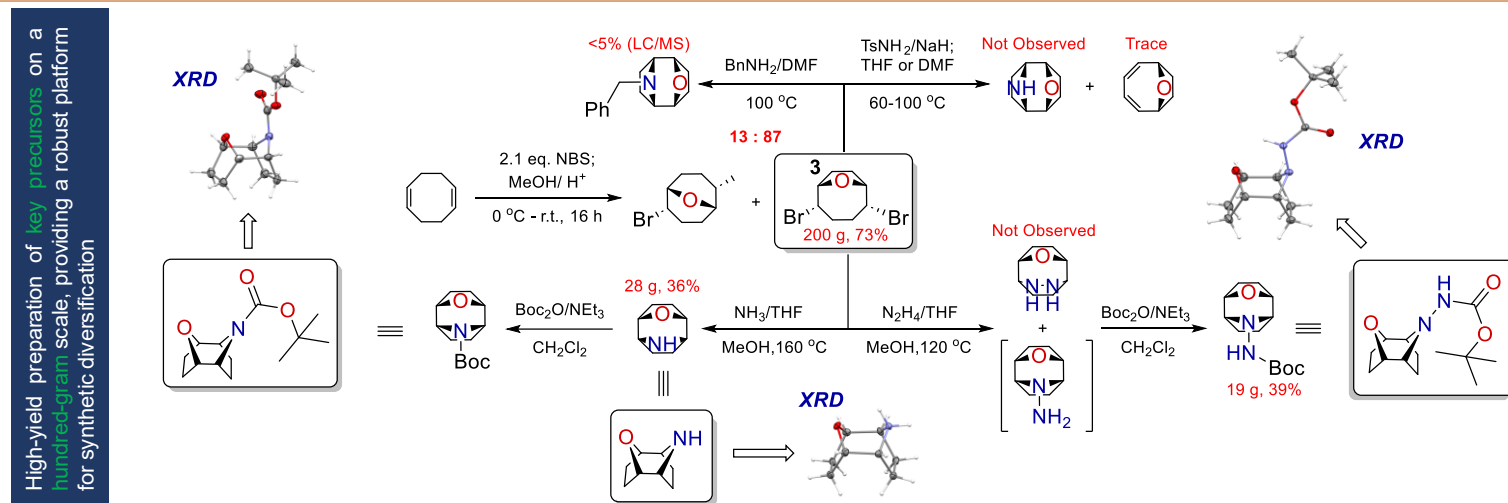
- A unified retrosynthetic strategy enables rapid access to diverse polycyclic cages, including bis-heteroatom-doped and morpholine-like frameworks, directly from COD;
- This divergent approach from COD streamlines the synthesis of 3D cage compounds with tunable physicochemical and pharmacological profiles.



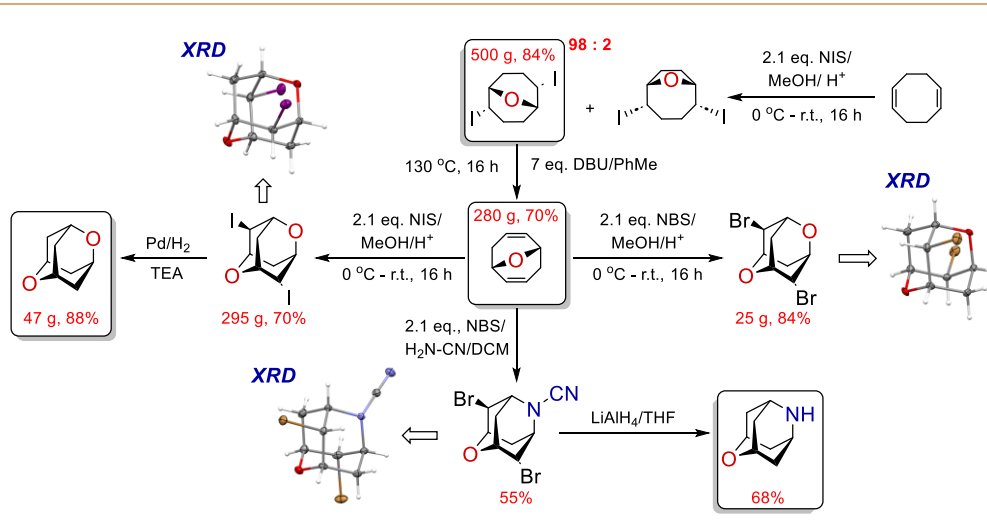
Contact & References

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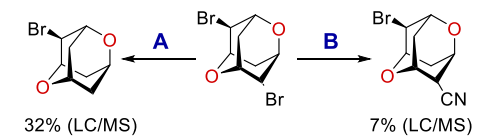
COD Derivatization (I): Scaling up the Precursors and Preparing New Morpholine-Like Scaffold



COD Derivatization (II): New Approach to Heteroadamantanes



Preliminary Desimmetrization Attempts



Conditions:

A: eq. Zn, TMSCl; 3 eq. PhCOCl; 2 eq. LiCl, CuCN(cat); THF, reflux 16 h

Conclusion and outlook:

- Conventional desymmetrization strategies remain ineffective for functionalizing hetAds, due to strong deactivation of the cage core;
- Emerging radical, photochemical, and catalytic C-H/C-X functionalization hold promise for unlocking the reactivity and diversification of these challenging compounds.

References: 1. Popov I, et al. Cyclooctadiene-Derived, ChemRxiv. **2024**; doi:10.26434/chemrxiv-2024-3kdn2