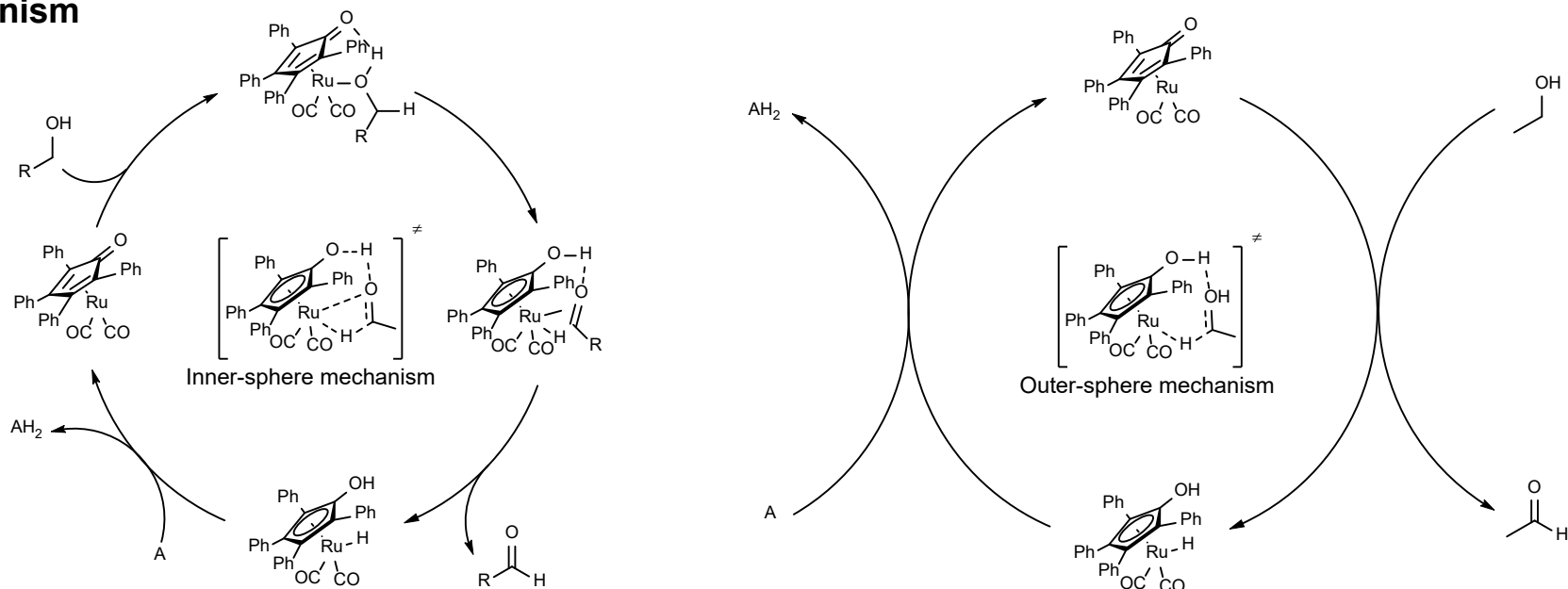
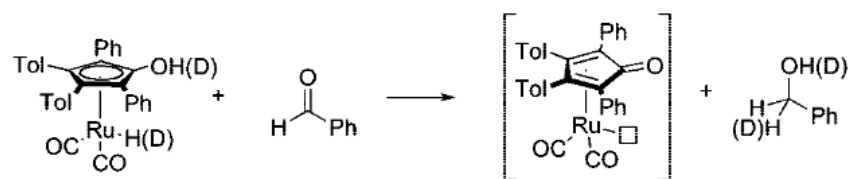




## Mechanism

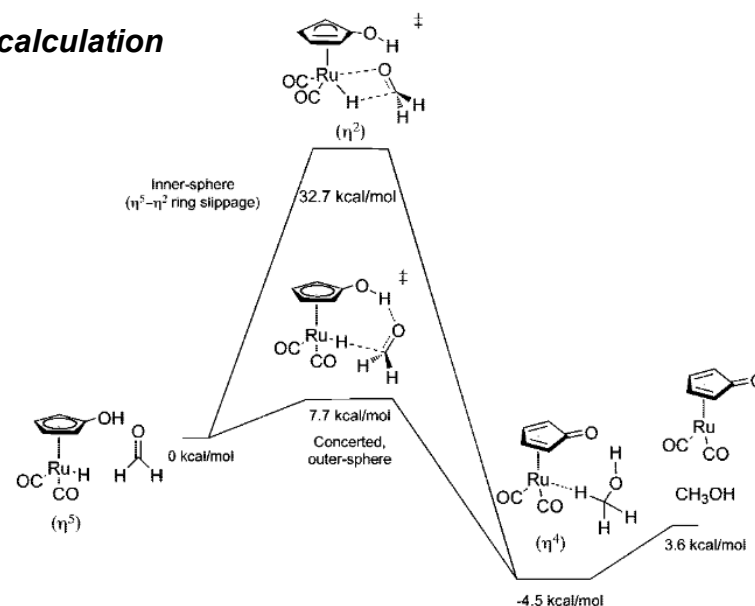


## KIE experiments

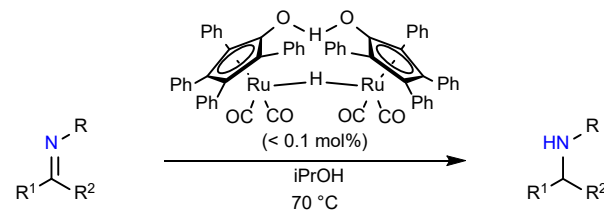
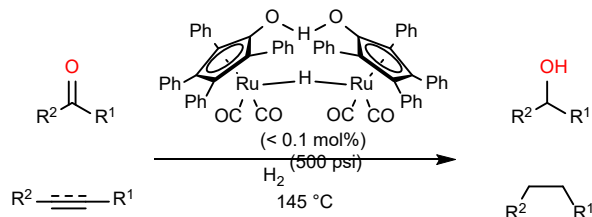


entry	KIE	studied value
1	$k_{\text{OHRuH}}/k_{\text{OHRuD}}$	1.5(2)
2	$k_{\text{ODRuH}}/k_{\text{ODRuD}}$	1.6(2)
3	$k_{\text{OHRuH}}/k_{\text{ODRuH}}$	2.2(1)
4	$k_{\text{OHRuD}}/k_{\text{ODRuD}}$	2.3(4)
5	$k_{\text{OHRuH}}/k_{\text{OD/RuD}}$	3.6(3)

## DFT calculation

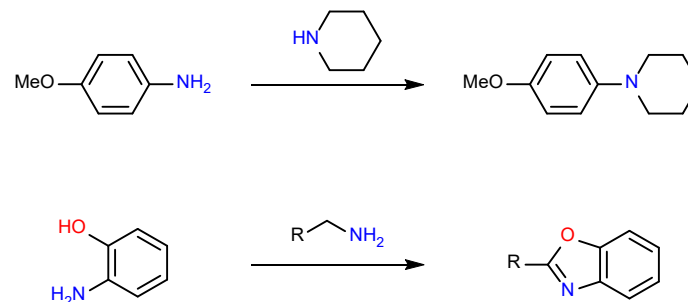
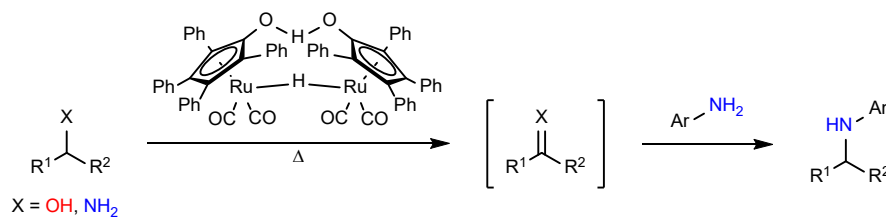


## Reactivity: reduction

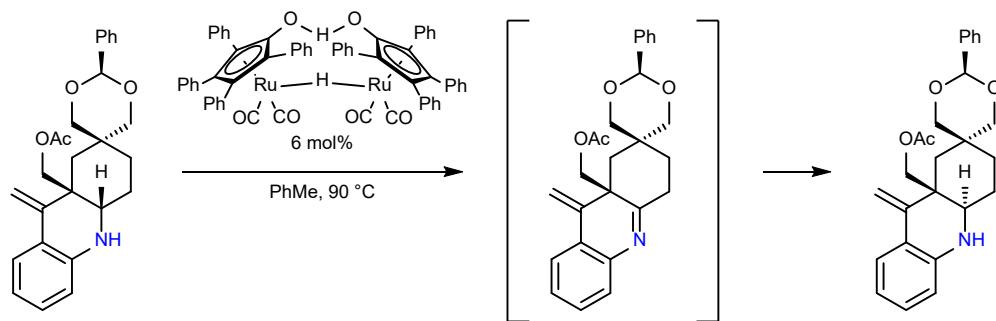


~ 26 times faster than corresponding ketone/aldehyde

## Reactivity: coupling



## Synthetic application



Irie, Y.; Yokoshima, S. *J. Am. Chem. Soc.* **2024**, *146*, 9526–9531. <https://doi.org/10.1021/jacs.4c02086>.

## Summary

- A useful transfer-hydrogenation catalyst for alcohol/amines
- Broad reactivity including oxidation/reduction/cross-coupling
- Low catalyst load, relatively mild conditions
- Sometimes requires high temperature