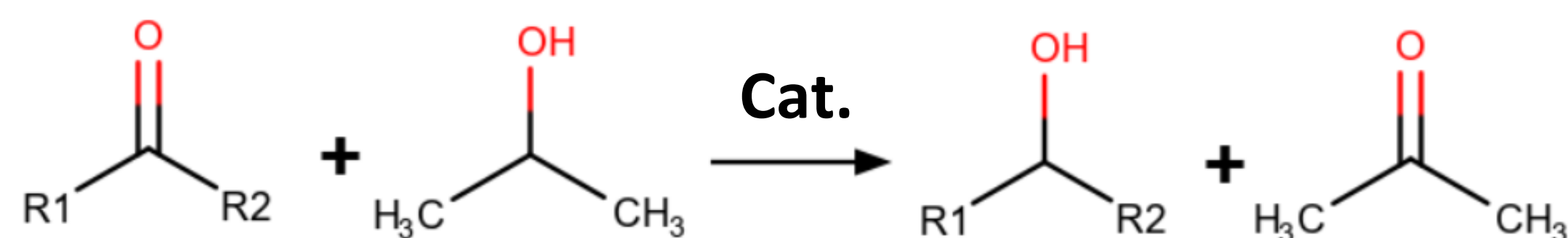


Transfer Hydrogenation using Vanadium (V) Catalysts

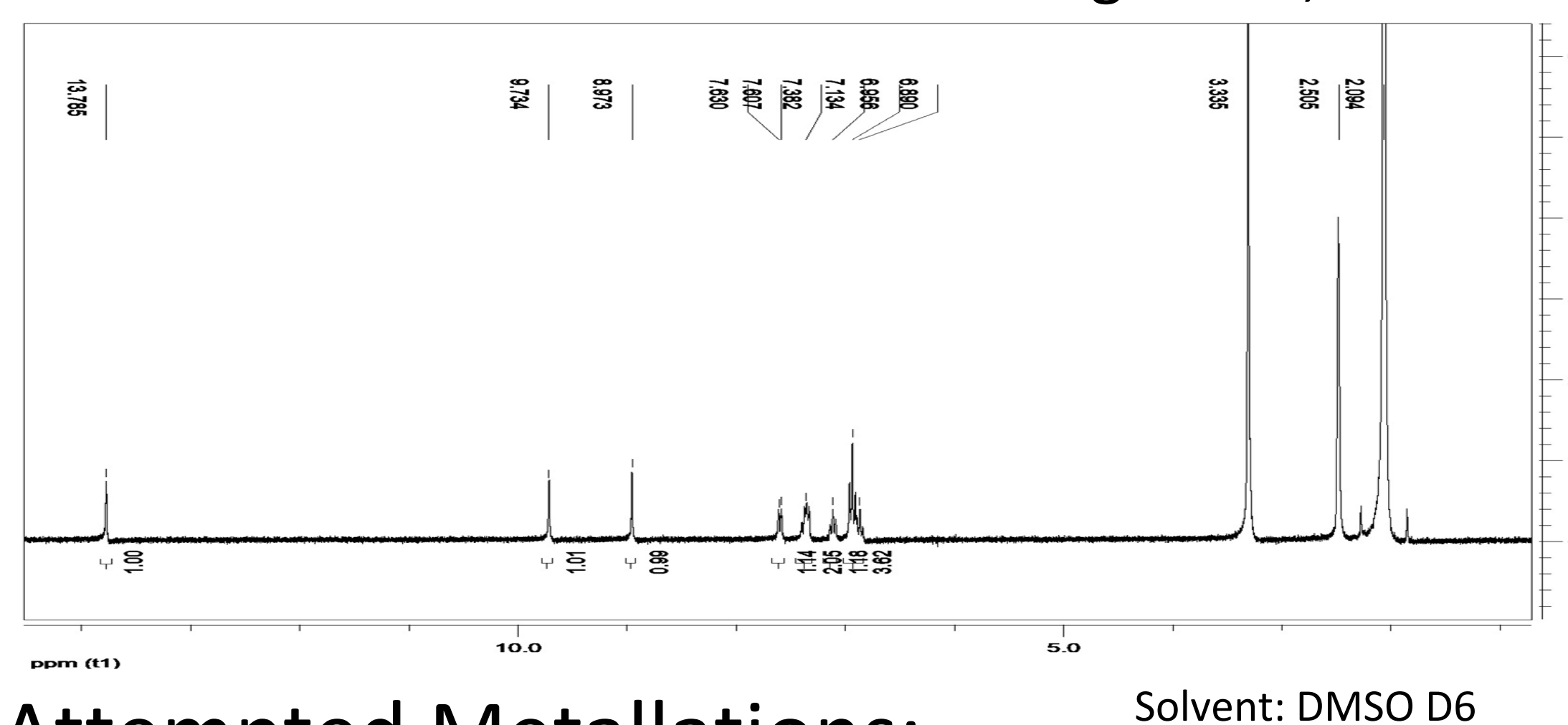
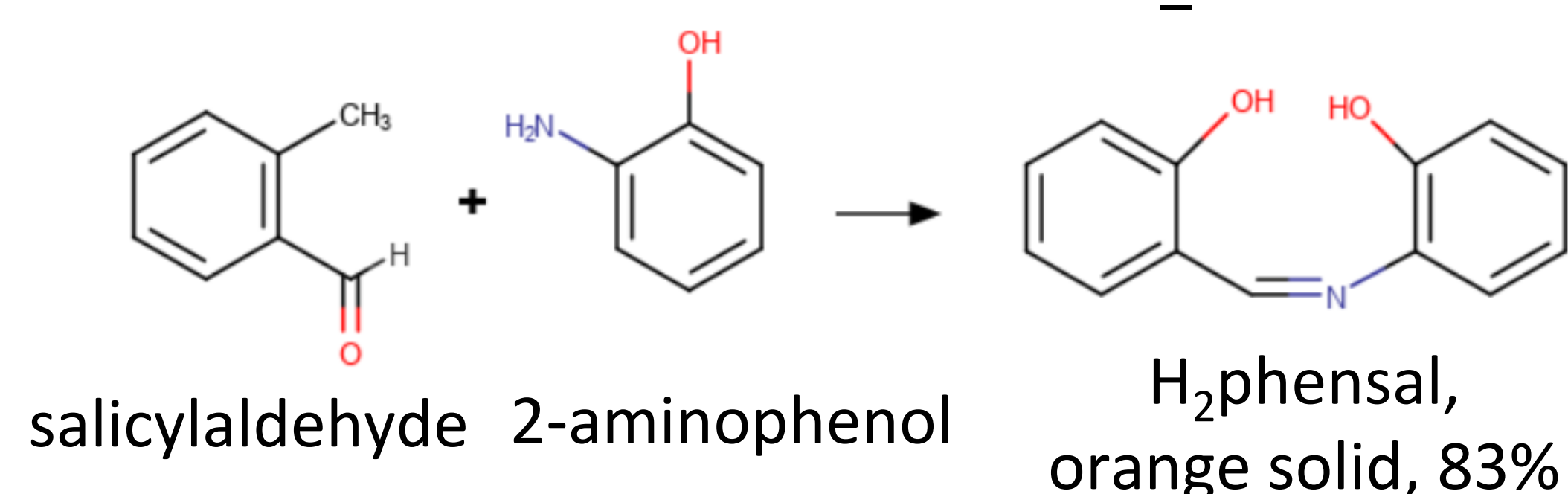
Catherine R. Christopherson and James F. Dunne

Introduction

Synthesize and characterize air stable vanadium complexes, and explore their ability to act as homogeneous catalysts for transfer hydrogenation of ketones.

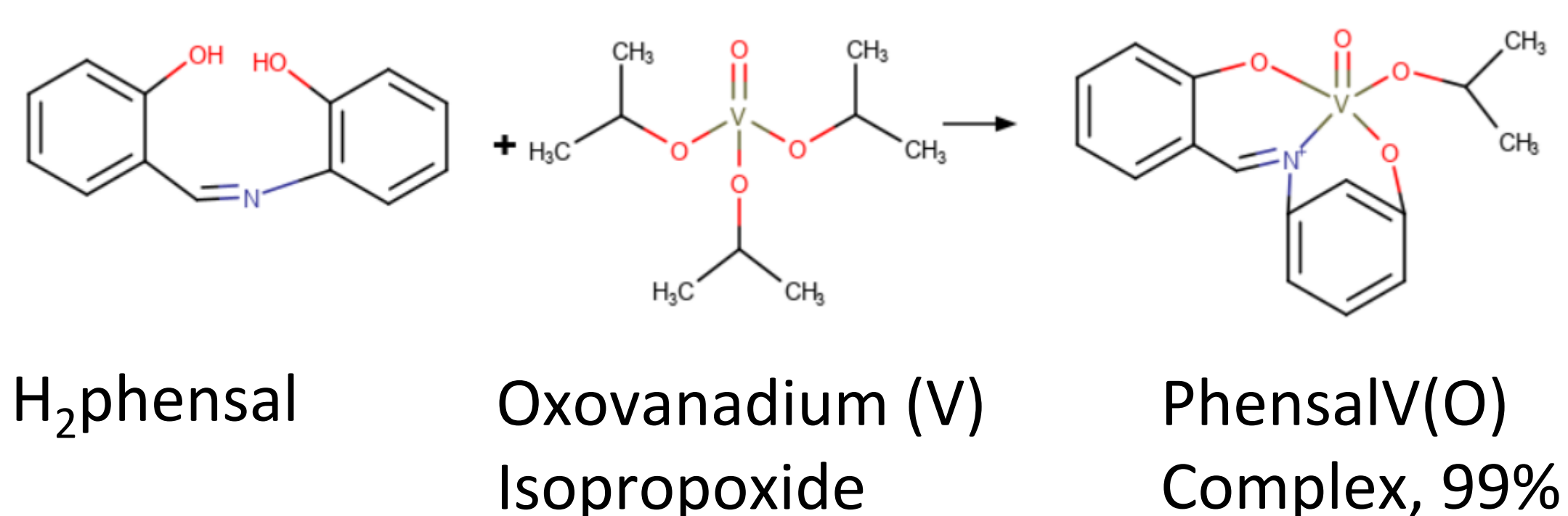


Synthesis and Structure of H₂phensal

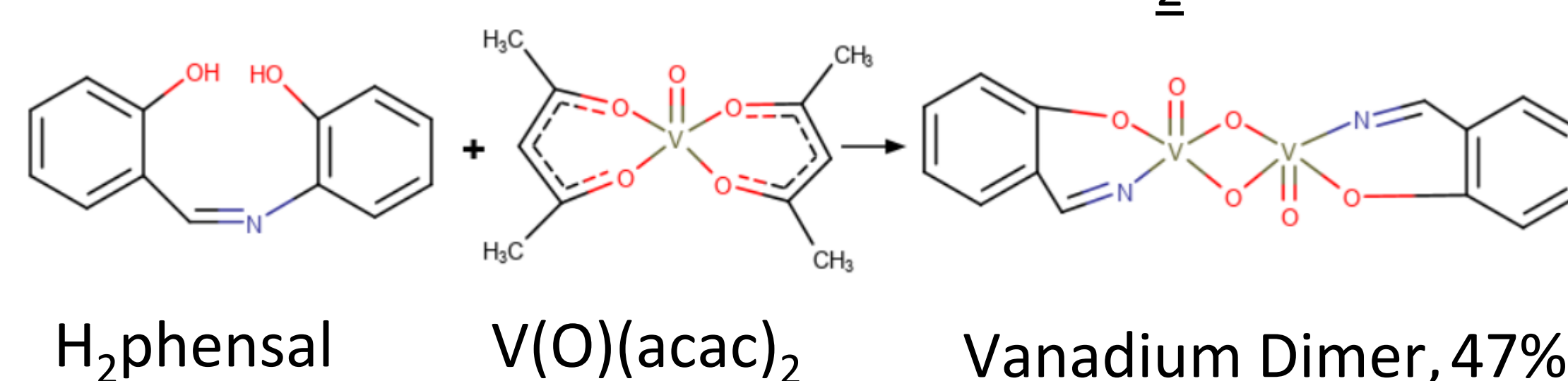


Attempted Metallations:

Reaction with Oxovanadium (V) Isopropoxide



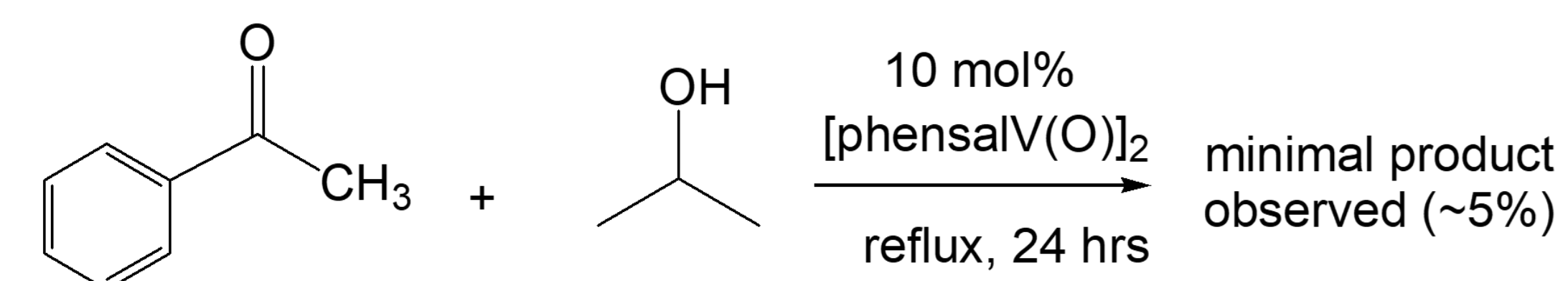
Reaction with Vanadium(O)(acac)₂



ATR-IR Shifts of the V=O and the C=N:

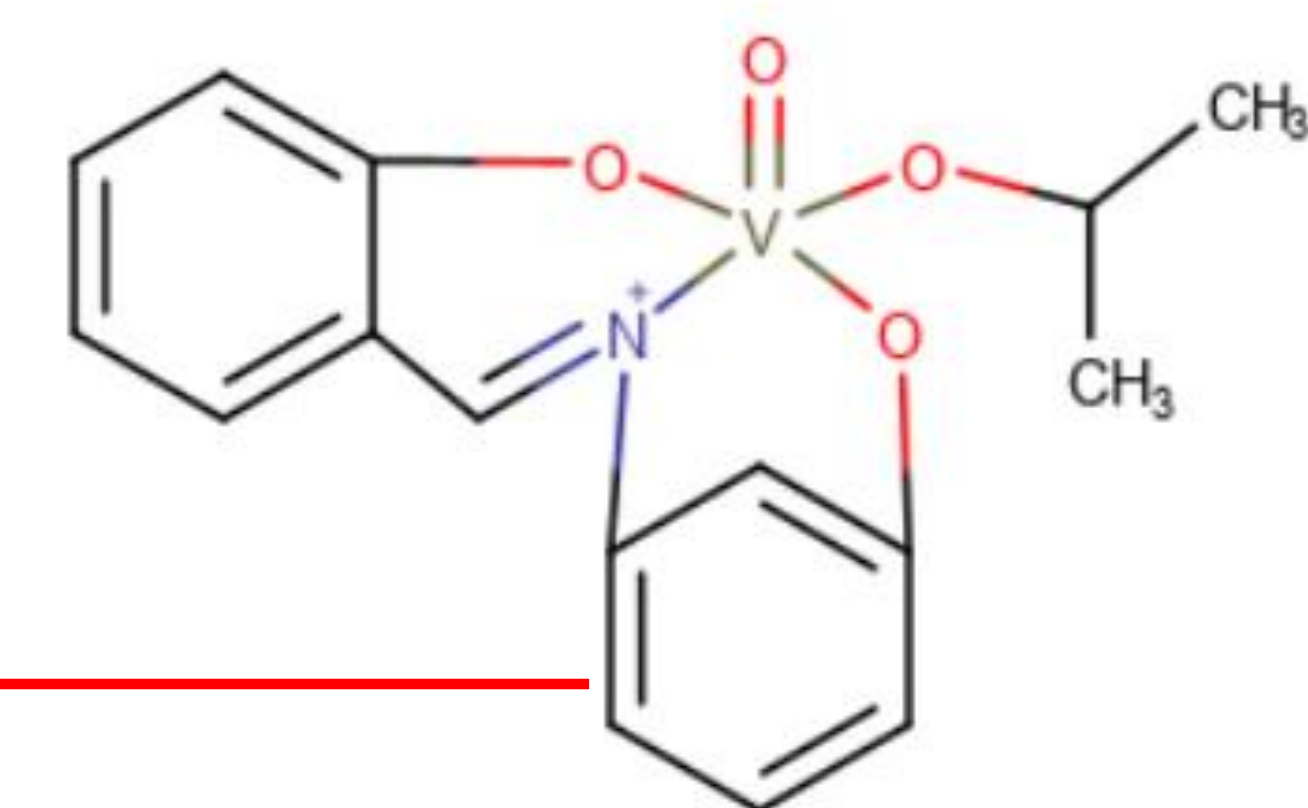
Compound	$\nu_{V=O} \text{ cm}^{-1}$	$\nu_{C=N} \text{ cm}^{-1}$
H ₂ phensal	---	1630
V(O)(O- <i>i</i> -Pr) ₃	969.6	---
PhensalV(O)(O- <i>i</i> -Pr)	987.0	1602.1
V(O)(acac) ₂	994.8	---
PhensalV(O)(acac)	987.8	1609.6

Initial Attempt at Transfer Hydrogenation



Future Work

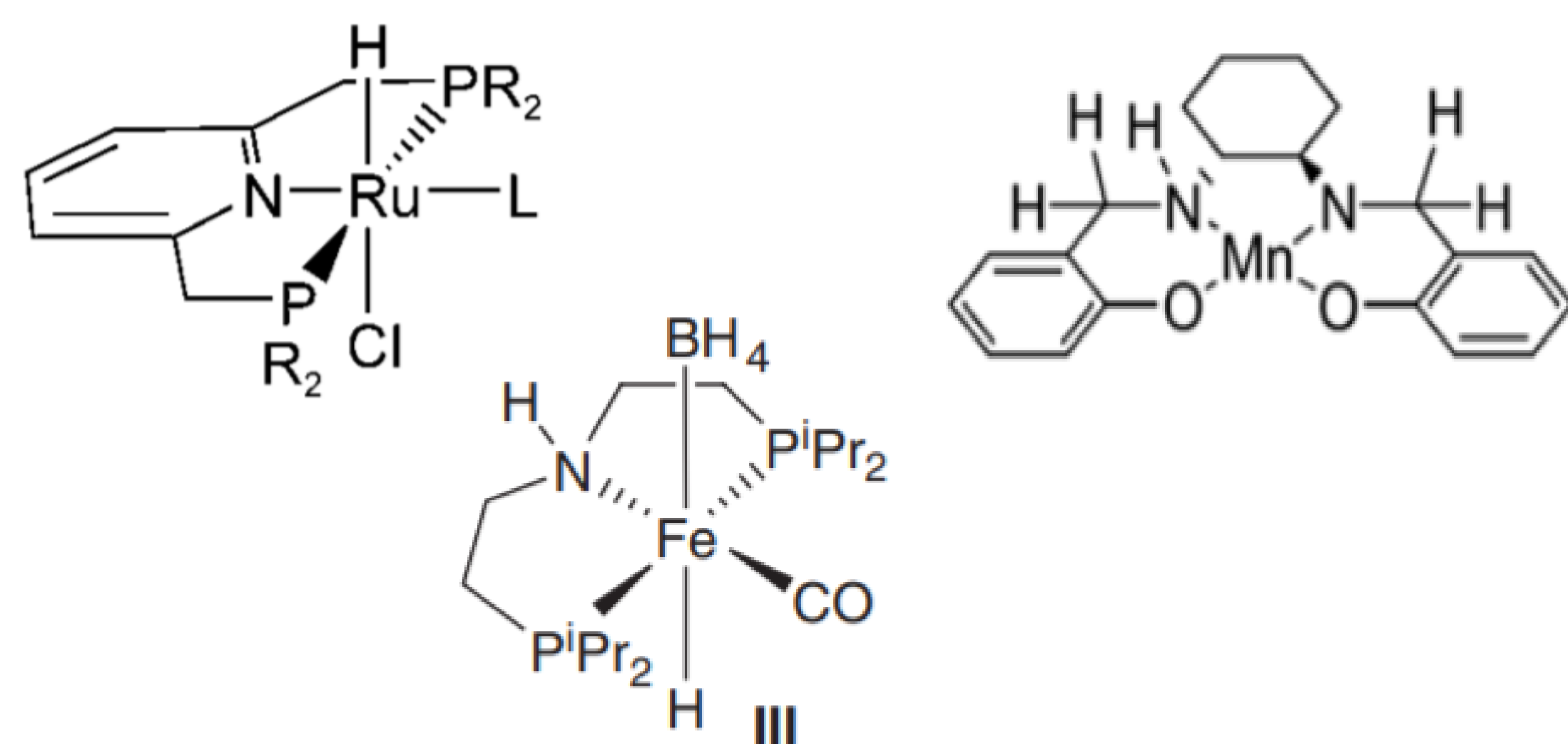
- Synthesizing final Vanadium complex
- Synthesize dioxovanadium compounds and test in oxygen atom transfer reactions
- Characterize current synthesized vanadium compounds



Proven Catalysts

Previously knowns used acceptorless dehydration of alcohol catalysts used for various applications:

- Ru Pincer complexes¹
- Fe catalyzed complexes²
- Mn(III) catalyst complex³



1. <https://chemistry-europe.onlinelibrary.wiley.com/doi/epdf/10.1002/cctc.200900124>
 2. <https://pubs.rsc.org/en/content/articlepdf/2019/sc/c8sc03969k>
 3. <https://www.nature.com/articles/s41467-017-01603-3.pdf>