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ABSTRACT N°000

Rh(I)-Catalysed Decarboxylative-Sulfonylation Reaction Unlocking Thiazete Dioxide Scaffold

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Wilkinson's rhodium (I) catalyst, [(PPh₃)₃RhCl], was first described in 1967.¹ Since then, the commercially available complex is extensively described for the hydrogenation of olefins.² The group of Ohe demonstrated that Wilkinson's complex in stoichiometric amounts can also insert into the weak N–O bond of oxime derivatives, leading to well-defined rhodacycles (Figure 1a).³ A reactivity, his group used to develop pyrrole's synthesis from isoxazolidinones.⁴ Recognizing that rhodium(I) complexes can coordinate a SO₂ molecule (Figure 1b),⁵⁻⁶ we aimed at merging these two reactivities.

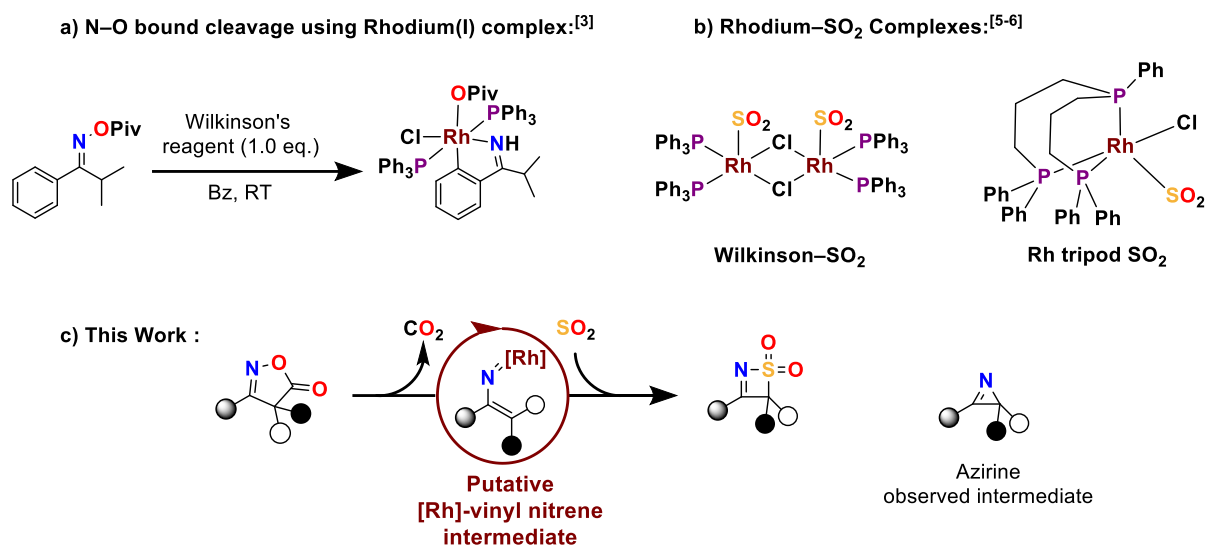


Figure 1

In this project, we have thus developed a rhodium–(I) catalyzed decarboxylative-sulfonative reaction, starting with easily accessible isoxazolidinones, where a CO₂ molecule is formally replaced with SO₂, leading to an unusual thiazete dioxide scaffold (Figure 1c). The structure of the product was confirmed through XRD analysis. Preliminary investigations on the catalytic system revealed that the catalyst's preparation is necessary to avoid rapid oxidation of the ligand by the SO₂ atmosphere. The reaction first goes through the *in situ* formation of azirine, which probably results from a [Rh]-vinyl nitrene.³

¹ J. A. Osborn, G. Wilkinson; *Inorg. Synth.*, **1967**, *10*, 67–71.

² B. Richter, A. L. Spek, G. van Koten, B.-J. Deelman; *J. Am. Chem. Soc.*, **2000**, *122*, 3945–3951

³ T. Shimbayashi, K. Okamoto, K. Ohe; *Organometallics*, **2016**, *35*, 2026–2031.

⁴ T. Shimbayashi, G. Matsushita, A. Nanya, A. Eguchi, K. Okamoto, K. Ohe; *ACS Catal.* **2018**, *8* (9) 7773–7780.

⁵ G.J.Kubas, R.R.Ryan; *Crystal. Struct. Commun.*, **1977**, *6*, 295.

⁶ P. Gary Eller, R. R. Ryan; *Inorg. Chem.*, **1980**, *19*(1) 142–147.