

Domesticating the Reactivity of Non-Octet Carbon toward Plethora of Chemistry

Tiow-Gan Ong^{a,b*}

^a*Institute of Chemistry, Academia Sinica, Taipei, Taiwan, ROC*

^b*Department of Chemistry, National Taiwan University, Taipei, Taiwan, ROC*

**tgong@gate.sinica.edu.tw*

The abstract: Carbodicarbenes (CDCs) are carbones (CL₂) repertoire that feature a dicoordinated central carbon (0) atom bearing two lone pairs of electrons, with N-heterocyclic carbenes (NHCs) as ligands (L). Because of the two lone pairs on the central carbon atom, CDCs have been regarded as strong σ -donating surrogates complementary to the well-established NHCs. This presentation will describe the synthetic preparation^[1] and chemical properties of the CDC^[2] as well as its application toward supporting metallic complexes for catalysis in tandem photoredox,^[3] cross-coupling reaction via tandem C-H and C-O bond activation^[4] and a new spin in diversifying FLP reactivity with co-modulator benzyl alcohol. Finally, we also described phosphine-stabilized dicarbon as effective ligand for metal complexes and catalysis.^[5] Dicarbon is a reactive carbon allotrope that naturally exists only in the high temperature medium of stellar space.

References (sample format)

1. Chen, W.-C.; Shen, J.-S.; Jurca, T.; Peng, C.-J.; Lin, Y.-H.; Wang, Y.-P.; Shih, W.-C.; Yap, G. P. A.; Ong, T.-G. *Angew. Chem. Int. Ed.* **2015**, *54*, 15422–15427.
2. Chen, W.-C.; Shih, W.-C.; Jurca, T.; Zhao, L.; Andrada, D. M.; Peng, C.-J.; Chang, C.-C.; Liu, S.-K.; Wang, Y.-P.; Wen, Y.-S.; Ong, T.-G. *J. Am. Chem. Soc.* **2017**, *139*, 12830–12836.
3. Hsu, Y.-C.; Wang, V. C. C.; Au-Yeung, K.-C.; Tsai, C.-Y.; Chang, C.-C.; Lin, B.-C.; Chan, Y.-T.; Hsu, C.-P.; Yap, G. P. A.; Jurca, T.; Ong, T.-G. *Angew. Chem. Int. Ed.* **2018**, *57*, 4622–4626.
4. Wang, T.-H.; Ambre, R.; Wang, Q.; Lee, W.-C.; Wang, P.-C.; Liu, Y.; Zhao, L.; Ong, T.-G. *ACS Catal.* **2018**, *8*, 11368–11376.
5. Leung, T.-F.; Jiang, D.; Wu, M.-C.; Xiao, D.; Ching, W.-M.; Yap, G. P. A.; Yang, T.; Zhao, L.; Ong, T.-G.; Frenking, G. *Nat. Chem.* **2021**, *13*, 89-93.