

CBC SEMINAR ANNOUNCEMENT



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Multicomponent Radical Reactions: Back to the Basics

Multicomponent reactions continue to attract considerable attention in organic synthesis driven by a desire to generate structural diversity from simple small molecules. For decades, tin reagents have been used as most popular mediators of radical reactions. Recent research has focused on seeking *greener* reagents as an alternative to tin and this led us to reconsider the potential of traditional radical chemistry for multicomponent reactions. Indeed we have been able to exploit the well known behavior of bromine radicals to add to unsaturated C-C bonds to develop novel three- and four-component radical reactions.¹ In addition the utility of photo-catalytic systems have also been pursued in our laboratory. Three component coupling between alkanes, carbon monoxide, and electron-deficient alkenes in the presence of a catalytic amount of $(n\text{Bu}_4\text{N})_4\text{W}_{10}\text{O}_{32}$ (TBADT) resulted in the efficient formation of unsymmetrical ketones.² A Pd/light system has also been developed for the reaction of alkyl halides, alkenes, carbon monoxide and nucleophiles.³ We also discuss the potential of $(n\text{Bu}_4\text{N})\text{BH}_3\text{CN}$ to act as a radical mediator of reductive radical chain reactions, which has enabled us to employ formaldehyde in radical hydroxymethylation reactions.⁴

1) Kippo, T.; Fukuyama T.; Ryu, I. *Org. Lett.* **2011**, *13*, 3864.

2) Ryu, I., Tani, A., Fukuyama, T., Ravelli, D., Fagnoni, M., Albini, A. *Angew. Chem. Int. Ed.*, **2011**, *50*, 1869.

3) Fusano, A.; Sumino, S.; Nishitani, S.; Inouye, T.; Morimoto, K.; Fukuyama, T. *Chem. Eur. J.* **2012**, *18*, 9415.

4) Kawamoto, T.; Fukuyama, T.; Ryu, I. *J. Am. Chem. Soc.* **2012**, *134*, 875.

Date:	7th November 2012 (Wednesday)
Time:	11:00am – 12:30pm
Venue:	NTU SPMS CBC Building Level 2, Conference Room
Host:	Assoc Professor Shunsuke Chiba