**Tata Institute of Fundamental Research**
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad – 500 046

# Internal Webinar

## Activation of methanol as a C1 source using Pd, Ru, and Co-compounds to make new C-C bonds

## Priyabrata Biswal

### NISER, Bhubaneswar

The borrowing hydrogen (BH) and interrupted-borrowing hydrogen (I-BH) approaches have emerged as powerful tools over the last few decades for the indirect functionalisation of methanol as a methylating agent. These approaches provide a greener alternative to regular C-C and C-hetero bond forming reactions, as they generate only $H_2$ and/or $H_2O$ as the by-products. We report different BH and I-BH approaches for the functionalisation of methanol as a C1 source[1] to synthesize α-methylated ketones and 1,5-diketones respectively, utilizing ketones or allyl alcohols. These methods were catalysed using Cobalt(II) porphyrin, N,N coordinated Ruthenium, N,C coordinated Ruthenium and commercially available $Pd(OAc)_2$ compounds as catalysts. The I-BH protocol was further successfully utilised for synthesising substituted pyridines *via* sequential addition. These pyridines have shown Aggregate Induced Emission Enhancement (AIEE) properties.

**References:**

1. Biswal, P.; Samser, S.; Nayak, P.; Chandrasekhar, V.; Venkatasubbaiah, K.,*J. Org. Chem.*2021, *86*, 6744-6754.
2. Biswal, P.; Samser, S.; Meher, S. K.; Chandrasekhar, V.; Venkatasubbaiah, K., *Adv. Synth. Catal.*2022, *364*, 413–419.
3. Biswal, P.; Subramani, M. S.; Samser, S.; Chandrasekhar, V.; Venkatasubbaiah, K., *J. Org. Chem.*2022, 10.1021/acs.joc.2c00653.
4. Biswal, P.; Mamidala, R.; Subramani, M. S.; Samser, S.; Venkatasubbaiah, K., *J. Org. Chem.*2019, *84*, 10472-10480. Samser, S.; Mohapatra, O; Biswal, P.; Venkatasubbaiah, K., *J. Org. Chem.*2021, *86*, 13744-13753.

***Friday, Sep 9th 2022***

***4:00 PM***