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EDITORIAL

Transition metal catalyzed synthesis of medicinally relevant molecules

Synthetic organic chemists are inherently creative and have impacted global health care business unimaginably by executing contemporary strategies to manufacture the products. Application of transition metals in the chemical industry has dramatically complemented the manufacturing of the goods right from commodity materials to very personalized medicines. Primarily, two types of challenges exist in the pursuit of development of medicines. The first one: How to design? The second one: How to make or manufacture them? Recent advances in drug discovery and process research have advanced the toolbox of enabling technologies for addressing these challenges encountered during drug development.

Transition metals in appropriately morphed oxidation states along with or without fully decorated ligands have found place in various named reactions (e.g., Heck, Negishi, Suzuki-Miyaura, Sonogashira, Migita, Tsuji-Trost, Buchwald-Hartwig, Ring-closing metathesis, etc.) These named reactions technically enable the scientists to make various bonds to achieve the synthesis of simple to highly complex framework towards rendering the sustainable and cost effective manufacturing of the life-saving medicines. Another challenge in the queue is the ability to conquer the manufacturing of these structurally complex medicines or APIs (Active Pharmaceutical Ingredients) by adopting metal catalyst-based approaches in most practical and robust manner at scale. Success in this endeavour depends on strategic route selection featuring fit-for-purpose catalysts aiming at chemoselective, regioselective and stereoselective products of choice. There are other perfectly controlled critical process parameters that add on to the ensuing success.

Such kind of catalytic processes offer various advantages over stoichiometric reagents based approaches. Production of materials can be transformed into highly atom-efficient along with substantially minimized PMI (Process Mass Intensity) and cost effective events by using these metals as catalysts.

All the research and review articles featured in this *Special Section* reflect the advantageous elements of Transition Metal Catalysed Reactions meant for the synthesis of medicinally relevant molecules.

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