Transition metals open up new opportunities for synthesis, because their means of bonding and their reaction mechanisms differ from those of the elements of the s and p blocks. In the last two decades the subject has mushroomed - established reactions are seeing both technical improvements and increasing numbers of applications, and new reactions are being developed. The practicality of the subject is demonstrated by the large number of publications coming from the process development laboratories of pharmaceutical companies, and its importance is underlined by the fact that three Nobel prizes have been awarded for discoveries in this field in the 21st Century already.

*Organic Synthesis Using Transition Metals, 2nd Edition* considers the ways in which transition metals, as catalysts and reagents, can be used in organic synthesis, both for pharmaceutical compounds and for natural products. It concentrates on the bond-forming reactions that set transition metal chemistry apart from "classical" organic chemistry. Each chapter is extensively referenced and provides a convenient point of entry to the research literature. Topics covered include:

- introduction to transition metals in organic synthesis
- coupling reactions
- C-H activation
- carbonylative coupling reactions
• alkene and alkyne insertion reactions

• electrophilic alkene and alkyne complexes

• reactions of alkyne complexes

• carbene complexes

• h 3 - or p -allyl -allyl complexes

• diene, dienyl and arene complexes

• cycloaddition and cycloisomerisation reactions

For this second edition the text has been extensively revised and expanded to reflect the significant improvements and advances in the field since the first edition, as well as the large number of new transition metal-catalysed processes that have come to prominence in the last 10 years – for example the extraordinary progress in coupling reactions using “designer” ligands, catalysis using gold complexes, new opportunities arising from metathesis chemistry, and C-H activation – without neglecting the well established chemistry of metals such as palladium.

*Organic Synthesis Using Transition Metals, 2nd Edition* will find a place on the bookshelves of advanced undergraduates and postgraduates working in organic synthesis, catalysis, medicinal chemistry and drug discovery. It is also useful for practising researchers who want to refresh and enhance their knowledge of the field.

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**NEW TO EDITION**

• new chapter on C-H activation

• includes a survey of the range of ligands developed for transition metal chemistry, from phosphines to NHCs
• discussion of the key features of organic catalysis: how to draw a catalytic cycle; and how catalysis contributes to atom economy and green chemistry

• coverage of Hiyama coupling, including the recent modifications of this reaction by Denmark and others.

• the heteroatom coupling and enolate coupling sections are greatly expanded, mainly due to the extensive work of Hatwig and Buchwald.

• new developments in sp3-sp3 coupling reactions are highlighted

• coupling without using palladium, including the Nozaki-Kishi reaction, are described

• expanded coverage of hydroformylation, particularly with the recent development of directed hydroformylation

• discussion of the Kulinkovich reaction

• includes much more material on gold chemistry

• the section on alkene metathesis is greatly expanded, including cross-metathesis and relay metathesis

• sections on asymmetric reactions are added to various chapters, including alkene and insertions (asymmetric Heck, Hoveyda chemistry), metathesis, fà-allyl complexes.

• Larger portions of total syntheses are highlighted, to put the transition metal chemistry into greater context.

• Special topics, such as tandem reactions, reactions that combine transition metals with other methods, solid supported reactions and flow reactions are demonstrated by examples at appropriate points.

• Includes key references and an index of compounds

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