Organolithiums: Selectivity for Synthesis; By J. Clayden; Pergamon: Oxford, **2002**, 384 pp, paperback, € 45; ISBN: 0-08-0432611

This book covers the many uses of organolithiums in synthetic organic chemistry with a systematic examination of the various aspects of lithium chemistry. Research in the last thirty years is examined with exhaustive literature references till almost almost the present. The book is within reach of all, specialists and postgraduates and it is advisable that every organic chemistry laboratory keeps one copy because it collects researches by all leader groups in this field.

The first chapter treats aggregation states and their stability in the most widely used solvents. The second chapter describes limits and potentiality of α- and *ortho*-directing groups: effective alternatives are proposed to obtain mono- and polysubstituted compounds; moreover mechanistic aspects, cooperative and competitive effects, regioselectivity of functional groups are described. The paragraph about superbases is too brief, even if other exhaustive books on this argument exist. The third chapter deals with the regioselective synthesis of organolithium intermediates through halogen-lithium exchange: mechanistic and synthetic aspects are treated and their complementarity with the corresponding deprotonation reactions is emphasized. In the same chapter the possibility to obtain lithiated intermediates through exchange with other elements (tin, sulfur, selenium, tellurium, phosphorus) is showed. The fourth chapter deals with another method to prepare lithiated intermediates: the arenes promoted reductive lithiation on carbon-heteroatom and carbon-carbon bond containing compounds. In the same chapter mechanistic aspects and main applications of reductive lithiation are described paying particular attention to carbohydrates and heterocyclic chemistry. The fifth chapter reports the detailed experimental determination of the configurational stability of cyclic and acyclic organolithiums, even recurring to crystallographic and theoretical data: it is underlined here how this stability is a function of the chemical environment (α to heteroatoms, of benzyl or vinyl type) of the concerned chiral centre. Then several kinds of chiral lithiated intermediates are reviewed reporting their stereospecific synthesis. Moreover a useful table is reported enclosing a qualitative guide to the configurational stability of organolithiums. The sixth chapter treats the stereospecificity and stereoselectivity of the substitution reactions of organolithiums even in the presence of chiral ligands: in particular the nucleophilic substitution reactions by stabilized and not stabilized organolithiums are described with all relative stereochemical requirements. The same reactions performed in the presence of chiral ligands are examined even considering problems of configurational stability and dynamic and kinetic resolutions. The seventh chapter deals with the racemic and chiral carbolithiation reactions on various substrates as functionalized or not-functionalized alkenes and alkynes, carbonyl compounds, epoxides, alkyl halides: the way to obtain from these compounds carbo- and heterocyclic derivatives through anionic cyclization is described. The eighth chapter deals with common rearrangements (Shapiro, Brook, Wittig), even through theoretical aspects, which are useful methods to prepare organolithiums difficult to obtain otherwise. The ninth chapter shows how complex structures can be prepared combining various lithiation procedures, such as Ochratoxin by *ortho*-lithiation and Fries rearrangement, or Fredericamycin through a combination of side- and α-litiations, or (±)-Atpenin by lithiation of a heterocyclic compound, or Flurbiprofen by metallation with superbases.

In conclusion after a careful reading I consider this book within reach of all and its use advisable for specialists and postgraduates and in every organic chemistry laboratory for it collects research of the most quoted groups in the organolithium field.

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