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Nota di contenuto	Organofluorine Chemistry; Contents; Preface; 1 Fundamentals in Organic Fluorine Chemistry; 1.1 Some physical properties of organic fluorine compounds; 1.1.1 Effect of the fluorine atom on the molecular orbital energy levels of organic molecules and refractive index; 1.1.2 Boiling points; 1.1.3 Miscibility; 1.1.4 Lipophilicity; 1.1.5 Gas solubility; 1.1.6 Surface tension; 1.1.7 Summary; 1.2 Electronic effect; 1.2.1 Electronic effects of the fluorine atom: insight from Hammett substituent constants; 1.2.2 Electronic effects on acidity, bond length, and bond energy of fluoroorganic molecules 1.2.3 Halogen bonding 1.2.4 Electronic effect on the destabilization of carbonyl and imono groups; 1.2.5 pi-pi Stacking of fluoroaromatics; 1.2.6 Increased p-character (Bent's rule) and low-lying LUMO in carbon-fluorine bonding orbitals; 1.2.7 Negative hyperconjugation; 1.2.8 Electron-donating effect (stabilization of carbocation); 1.2.9 Effect of fluorine substituents on the structure, stability, and reactivity of fluoroalkyl radicals; 1.3 Steric effects of fluorine substituents; References; 2 Unique Reactions Induced by Fluorine; 2.1 Nucleophilic

substitution on fluoroaromatic rings

2.2 SN2' reactions of alkenes bearing a trifluoromethyl group

2.3 Nucleophilic substitution on the gem-difluoromethylene double bond;

2.4 Single electron transfer reaction of perfluoroalkyl halides;

2.5 Fluorine-activated electrophilic reagents (F-X and XFn);

2.5.1 Halogen monofluoride (F-halogen);

2.5.2 Bromine trifluoride (BrF₃);

2.5.3 Iodine pentafluoride (IF₅);

2.5.4 Iodoarene difluoride (ArIF₂);

2.5.5 Benzeneselenenyl fluoride (PhSeF);

2.5.6 tert-Butyl and methyl hypofluorites;

2.5.7 Hypofluorous acid - MeCN complex (HOF - MeCN);

References

3 Reactions Activated by a Strong Interaction Between Fluorine and

Other Atoms

3.1 Reaction induced by F-Li interaction;

3.1.1 Li-F

interaction in aromatic C-F bonds;

3.1.2 Li-F interaction in aliphatic C-

F bonds;

3.2 The fluorine-aluminum interaction;

3.3 Reactions induced

by F-Si interaction;

3.3.1 Fluoride-ion mediated desilylative alkylations;

3.4 Reactions induced by B-F interaction;

3.5 Reactions activated by a

strong interaction between fluorine and Sm, Yb, Sn, Ti;

References;

4 Hydrogen Bonding in Organofluorine Compounds;

4.1 Organofluorine

as a hydrogen-bonding acceptor

4.1.1 Definition and classifications of hydrogen bonds

4.1.2 Some

examples of O-H ··· F-C and N-H ··· F-C hydrogen-bonding systems;

4.1.3 Some examples on nonconventional hydrogen bonding: C-H ··· F-

C interactions;

4.1.4 Summary of organic fluorine as hydrogen-bonding

acceptor;

4.2 Hydrogen bonding of B-fluorinated alcohols, its structural

character, and utilization in organic syntheses;

4.2.1 Use of TFE and

HFIP for protonating agents and/or protonating solvents;

4.2.2 Use of

TFE and HFIP for cation-stabilizing solvents;

References;

5 Fluorinated

Ligands for Selective Catalytic Reactions

5.1 Ligands with fluorine-substituted aryl groups

Sommario/riassunto

The replacement of hydrogen with fluorine in organic molecules can profoundly influence their chemical and physical properties, leading to a range of compounds with highly desirable properties. These molecules are of interest across the wide spectrum of industrial and academic organic chemistry, so that organofluorine chemistry is economically highly important. Organofluorine Chemistry will help chemists to develop a systematic knowledge of the chemistry of fluorine with a view towards its application in the design of new reactions and syntheses, and the creation of novel fluorinated mo

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