Organic synthesis I

Recommended literature:

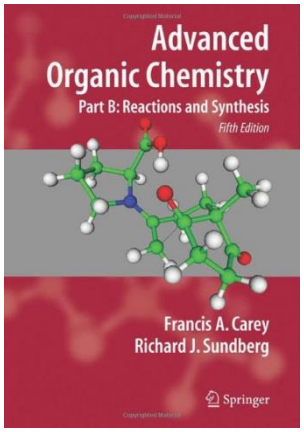
F.A. Carey, R. J. Sundberg: *Advanced Organic Chemistry, Part B*

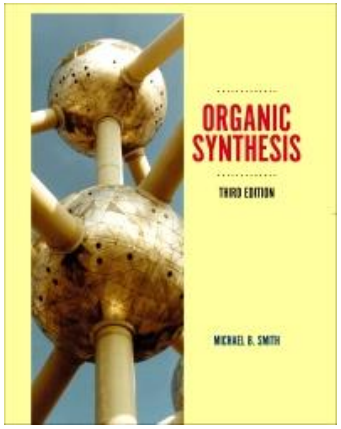
M. B. Smith: *Organic Synthesis*

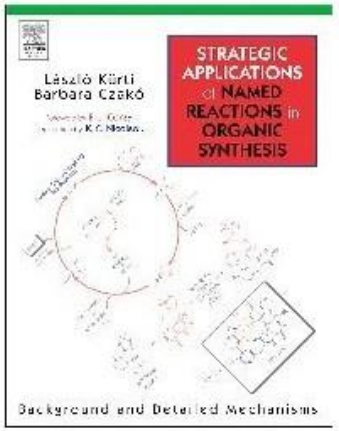
M. B. Smith, J. March: *Advanced Organic Chemistry: Reactions, Mechanisms and Structure*

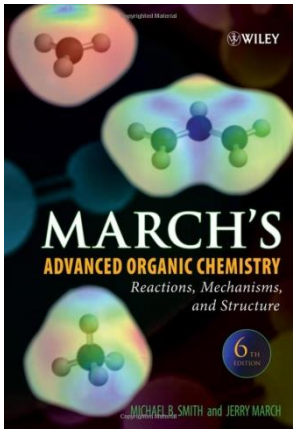
L. Kürti, B. Czakó: *Strategic Applications of Named Reactions in Organic Synthesis*

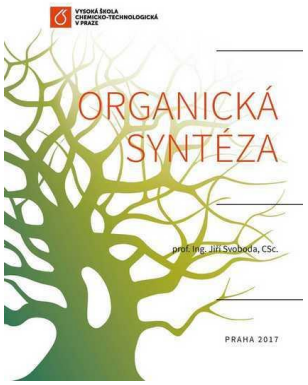
J. Svoboda: *Organický syntéza (in Czech)*











Organic synthesis I

Syllabus:

1. General info
2. Reduction in Organic Synthesis (Red)
3. Oxidation in Organic Synthesis (Ox)
4. Functional Group Interconversion (FGI)
5. Electrophilic Additions to C=C (Ad)
6. Preparation of Enolates and Alkylations (Enol)
7. Reactions of Carbon Nucleophiles with C=O (CO)
8. Aromatic Substitutions (Ar)
9. Cycloaddition Reactions (CA)
10. Rearrangements (Rearr)

General Info

Abbreviations:

R - alkyl (Me, Et, Pr, Bu, i-Pr, i-Bu, sec-Bu, terc-Bu)

Ar - aromatics or heteroaromatics (Het)

X - halogen (also OTs, OMs, OTf etc.)

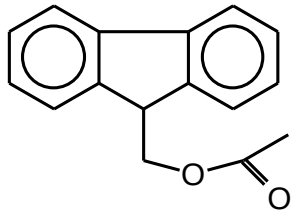
Ts, Ms, Tf, Ns

Ph = fenyl **Bn = benzyl** **Tr, py, PMP**

Ac = acetyl **Bz = benzoyl**

Carbamates: Cbz (Z), BOC, Troc,

Fmoc = fluorenylmethyloxycarbonyl

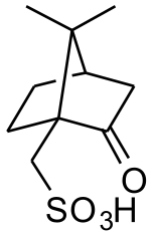


General Info

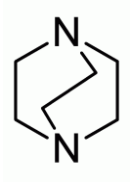
Abbreviations:

Bipy, Cod, Cot, CAN

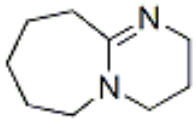
CSA



DABCO



DBU



DCC, DEAD, DIAD, DIBAL-H, DIPEA

DMAP, DME, DMF, DMS, DMSO, HMDS, HMPA, IPA, MCPBA, NBS, NIS

NMM, NMO, NMP, PCC, TEA, TFA, THF, THP, aj.

Organic synthesis I

Contact:

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laboratory room: 141,143

Requirements for passing the credit:

- oral presentation (10min)

Requirements for passing the exam:

- written part (above 60%)
- oral part

Organic synthesis I

Presentation topic	Chapter	Name
Acylation of Alcohols, Fischer Esterification, Preparation of Amides (SC 3.4)	FGI	
The Nitrogen Analogs of Enols and Enolates: Enamines and Imine Anions (SC 1.3)	Enol	
Electrophilic Cyclization (SC 4.2)	Ad	
Acylation of Carbon Nucleophiles – Claisen, Dieckmann, and with Other C-Nucleophiles (SC 2.3)	CO	
Reactions Proceeding by Addition-Cyclization (SC 2.5)	CO	
Transition Metal–Catalyzed Aromatic Substitution Reactions (SC 11.3)	Ar	
Unimolecular Thermal Elimination Reactions (SC 6.6)	Rearr	
Hydroxy-Protecting Groups *(SC 3.5.1)*	FGI	
Amino-Protecting Groups *(SC 3.5.2)*	FGI	

Organic synthesis I

Presentation topic	Chapter	Name
Carbonyl- and Carboxylic Acid-Protecting Groups (SC 3.5.3-3.5.4)	FGI	
Sharpless Epoxidation/Dihydroxylation	Ox	
Pauson Khand Reaction	FGI	
Staudinger Reaction	CA	
Nef Reaction		
Prins Reaction		
Stetter Reaction		
RAMP/SAMP Hydrazine-alkylation Reaction		
Evans Chiral Oxazolidinone chemistry		

Organic synthesis I

Presentation topic	Chapter	Name
Pinnick oxidation	Ox	
Benzoin reaction		
Corey-Bakshi-Shibata reduction	Red	
Ley oxidation	Ox	
Azide-alkyne cycloaddition	CA	
Tishchenko reaction		