Things to Know for Exam 3

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Common alcohol and ether names and IUPAC nomenclature
Hydrogen bonding in alcohols and ethers
Acidity as regards electron withdrawal or donation
Use of alcohols as acids or bases
Reagents used for formation of alkoxides, Na, K, NaH, CH_3Li
Preparation of alcohols
1) Hydration, mechanism and regiochemistry
2) Oxymercuration-demercuration, mechanism and regiochemistry
3) Hydroboration followed by oxidation, mechanism, regiochemistry, stereochemistry
4) Formation of cis diols by OsO_4 followed by $NaHSO_3$, stereochemistry
5) Formation of trans diols by peracid oxidation followed by acid cleavage, mechanism
Determination if a reaction is reduction, oxidation or neither (determination of the oxidation level at carbon)
Reducing agents: $NaBH_4$, $LiAlH_4$, H_2/Pd and what functional groups they reduce
Hydrides, Grignards and lithium reagents function as bases when treated with acids
Dehydration of alcohols with H_2SO_4, mechanism, limitations
Conversion of alcohols to alkyl halides: HCl, HBr or HI; 1^o, 2^o, $SOCl_2$/pyridine or PBr_3, inversion mechanism
Conversion of alcohols to tosylates or mesylates in presence of pyridine, retention mechanism
Oxidizing agents and their reactions: 1.OsO_4 2.$NaHSO_3$; $KMnO_4$; CrO_3/H_2SO_4; PCC; peroxyacids
Oxidation mechanism of chromium reagents
Protection of alcohols as silyl ethers, deprotection, mechanism
Williamson ether synthesis, mechanism and limitations
Alkoxymercuration-demercuration of alkenes, mechanism
Ethers by intermolecular dehydration of alcohols, limitations
Acid cleavage of ethers
Preparation of epoxides: peracids, intramolecular Williamson synthesis
Ring opening of epoxides, acidic, basic, mechanism, regiochemistry, stereochemistry
Reaction of Grignards and lithium reagents with epoxides, mechanism
Nucleophilic addition mechanism for Grignards, lithium reagents and hydrides to aldehydes, ketones, esters
Reduction of acid anions by Li AlH_4
Coupling of cuprates with halides
Allylic bromination (NBS), low concentration of Br_2, mechanism
Rules for writing resonance structures
Conjugated systems and their special properties: stabilty, uv absorption
MO diagrams of ethylene, 1,3-butadiene, allyl intermediates and related systems
Preparation of conjugated dienes
Electrophilic addition to conjugated dienes: HCl, HBr, Cl_2, Br_2
Kinetic vs. thermodynamic control of a reaction
Drawing resonance structures for extended conjugated pi systems, cations, anions, radicals
Conjugation of a double bond with heteroatoms (N, O, Cl)
Ultraviolet and visible spectroscopy, wavelength ranges, electron excitation, A = eCl
Diels-Alder reaction, mechanism