

O-Chem II Topics

Topic	Comments
<b>13 Nuclear Magnetic Resonance Spectroscopy</b>	
13.1 Nuclear Spin States	Energy states and their orientation; spin #'s; units for magnetic field;
13.2 Orientation of Nuclear Spins in an Applied Magnetic Field	effect of nuclear spins in magnetic fields
13.3 Nuclear Magnetic Resonance	concept of resonance; signals; diamagnetic current; shielding-desielding; ppm & TMS
13.4 An NMR Spectrometer	basic parts
13.5 Equivalent Hydrogens	be able to label classify; upfield & downfield
13.6 Signal Areas	integration and its use
13.7 Chemical Shift	electronegativity effects; hybridization and diamagnetic effects; ring current
13.8 Signal Splitting and the (n + 1) Rule	application and use
13.9 The Origins of Signal Splitting	theory of splitting and recognition of patterns (s, d, t, etc); multiple splittings
13.13 Interpretation of NMR Spectra	Major functional groups; splitting patterns; multiple splitting
<b>15 Organometallic Compounds</b>	
15.1 Organomagnesium and Organolithium Compounds	Rxns with carbonyls & epoxides ( <b>Mechanism</b> )
15.2 Lithium Diorganocopper (Gilman) Reagents	Coupling with halides (alkyl & vinyl)
15.3 Carbenes and Carbenoids	Insertion reactions: carbene & dihalocarbenes; Simmons-Smith rxn
<b>16 Aldehydes and Ketones</b>	
16.1 Structure and Bonding	Polarity properties; bond characteristics
16.2 Nomenclature	trivial names of compounds on slides; basic nomenclature
16.3 Physical Properties	solubility trends; BP & or MP trends; spectral properties
16.4 Reactions	Reaction theme: addition to give tetrahedral intermediate
16.5 Addition of Carbon Nucleophiles	Grignards to give ROH; organolithiums; acetylide; cyanide-use of cyanohydrins; <b>mechanisms</b> of all these
16.6 The Wittig Reaction	use with carbonyls to make alkenes
16.7 Addition of Oxygen Nucleophiles	Hydrates: definition; hemiacetal; acetal formation; <b>mechanisms</b> (acid & base)
16.8 Addition of Nitrogen Nucleophiles	imines and enamines-formation and hydrolysis; <b>mechanisms</b>
16.9 Keto-Enol Tautomerism	acidity of $\alpha$ hydrogens (significance)
16.10 Oxidation	RHO & ROH-use of all Cr <sup>+6</sup> reagents; Silver oxide; O <sub>2</sub>
16.11 Reduction	metal hydride reductions; cat H <sub>2</sub> ; Clemmenson; Wolff-Kishner
<b>CUT-OFF for XM 1</b>	