Basic Organic Chemistry Quiz

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| |  | | --- | | **1.** **Which of the following types of reactions involves R-X, Li, CuI, and R'-X?** |   Clemmenson Reduction  Corey-Posner , Whitesides-House synthesis  Friedel-Crafts Alkylation  Grignard synthesis |

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| |  | | --- | | **2.** **In the type of reaction involving R-X, Li, CuI, and R'-X?; R'-X must NOT be which of the following?** |   Primary  Secondary cycloalkyl  Methyl  Tertiary |

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| |  | | --- | | **3.** **Grignard reagents react with ketones to form which of the following?** |   Tertiary alcohols  Secondary alcohols  Primary alcohols  Carboxylic acids |

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| |  | | --- | | **4.** **Which of the following is a Huckel number?** |   10  12  8  16 |

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| |  | | --- | | **5.** **Which of the following are reagents used in the nitration of benzene?** |   Concentrated NO3  Dilute solutions of NO3 and H2SO4  Conc. HNO3 and conc. H2SO4  Ammonia |

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| |  | | --- | | **6.** **Which of the following is NOT associated with oxidation?** |   PCC  LiAlH4  Jones Reagent  Hot KMnO4 |

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| |  | | --- | | **7.** **Which of the following will reduce an aldehyde but not a carboxylic acid?** |   NaBH4  H2, Pt catalyst  LiAlH4  PCC |

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| |  | | --- | | **8.** **If branching of the side chain in the product is a problem in Friedel-Crafts alkylation, how can a product with an unbranched side chain be reached?** |   Use Cl2 instead of AlCl3  It can't--the more stable carbocation cannot be avoided  Friedel-Crafts acylation followed by Clemmenson reduction  Treat the product with a strong acid |

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| |  | | --- | | **9.** **A methyl group on benzene is considered which of the following?** |   Ortho-para director, deactivating  Ortho-para director, activating  Meta director, activating  Meta director, deactivating |

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| |  | | --- | | **10.** **When an alcohol is exposed to an acid, what is the first thing that always happens?** |   Protonation of the hydroxyl group  A double bond forms  An acid-base reaction  It becomes a diol |

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| Results for **Basic Organic Chemistry** |

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| |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | | **1.** Which of the following types of reactions involves R-X, Li, CuI, and R'-X? |   **Your Answer:** [No Answer]  The correct answer was Corey-Posner , Whitesides-House synthesis  If you picked Grignard synthesis, close, but not exactly. Grignard syntheses make {alcohols;} Corey-Posner syntheses make new carbon-carbon bonds.   |  |  | | --- | --- | | **26%** of players have answered correctly. |  | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | | **2.** In the type of reaction involving R-X, Li, CuI, and {R'-X?;} R'-X must NOT be which of the following? |   **Your Answer:** [No Answer]  The correct answer was Tertiary  By the way, I was nice and didn't throw in secondary by itself without the cycloalkyl part. :)   |  |  | | --- | --- | | **47%** of players have answered correctly. |  | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | | **3.** Grignard reagents react with ketones to form which of the following? |   **Your Answer:** [No Answer]  The correct answer was Tertiary alcohols  A ketone already has two R groups, the Grignard adds a third, and protonation removes the MgX to form a hydroxyl group.   |  |  | | --- | --- | | **35%** of players have answered correctly. |  | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | | **4.** Which of the following is a Huckel number? |   **Your Answer:** [No Answer]  The correct answer was 10  The Huckel rule is: 4n + 2. 8-2=6, 12-2=10, and 16-2=14, none of which can be divided by four to produce a whole number. {10-2=8;} 8 divided by 4 is {2;} therefore, 10 is a Huckel number.   |  |  | | --- | --- | | **39%** of players have answered correctly. |  | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | | **5.** Which of the following are reagents used in the nitration of benzene? |   **Your Answer:** [No Answer]  The correct answer was Conc. HNO3 and conc. H2SO4  The sulfuric acid aids in production of the electrophile, O=N(+)=O (sorry, hard to show structure here). The acids must be concentrated, or the reaction will not work!   |  |  | | --- | --- | | **59%** of players have answered correctly. |  | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | | **6.** Which of the following is NOT associated with oxidation? |   **Your Answer:** [No Answer]  The correct answer was LiAlH4  LiAlH4 (LAH) is a reducing agent, the others all oxidize alcohols to carbonyl compounds.   |  |  | | --- | --- | | **50%** of players have answered correctly. |  | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | | **7.** Which of the following will reduce an aldehyde but not a carboxylic acid? |   **Your Answer:** [No Answer]  The correct answer was NaBH4  LAH will reduce the aldehyde AND the carboxylic acid, H2, Pt catalyst will reduce neither functional group, and PCC is an oxidizing agent, not a reducing agent.   |  |  | | --- | --- | | **40%** of players have answered correctly. |  | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | | **8.** If branching of the side chain in the product is a problem in Friedel-Crafts alkylation, how can a product with an unbranched side chain be reached? |   **Your Answer:** [No Answer]  The correct answer was Friedel-Crafts acylation followed by Clemmenson reduction  Ok, this one was obvious--none of the incorrect answers make any sense. (While the tertiary carbocation cannot be avoided in Friedel-Crafts alkylation, there is definitely still a way to synthesize the desired product--never give up!)   |  |  | | --- | --- | | **44%** of players have answered correctly. |  | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | | **9.** A methyl group on benzene is considered which of the following? |   **Your Answer:** [No Answer]  The correct answer was Ortho-para director, activating  The methyl group directs substituents to either the ortho (1,2) or para (1,4) position, not the meta (1,3), which is generally less stable. The methyl group also causes the compound to be more reactive than benzene itself, so it is an activating group.   |  |  | | --- | --- | | **49%** of players have answered correctly. |  | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  |  | |  | | --- | | **10.** When an alcohol is exposed to an acid, what is the first thing that always happens? |   **Your Answer:** An acid-base reaction  The correct answer was Protonation of the hydroxyl group  Protonation is always the first step because OH is a poor leaving group, and (+)OH2 is a good leaving group. The elimination can only occur after protonation, thus forming the double bond.   |  |  | | --- | --- | | **58%** of players have answered correctly. |  | | |

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