Questions from the "PAL Prüfungsbuch"
Synthesis methods, reaction equations, influencing reactions

088: What is the reason for the reaction acceleration by catalysts?

1) The phase separation of the reaction partners
2) The reduction of the activation energy
3) Change of concentrations
4) The elevation of the partial pressure in gas reactions
5) The reduction of the temperature of the final products

094: Which label for an electrophilic reagent is *wrong*?

1) „Lewis"-base
2) Electron-deficient
3) Is able to absorb a pair of electrons
4) Electron pair gap
5) Often a cation

095: Which one of the following particles is *not* an electrophile?

1) H^+
2) CN^-
3) NO_2^+
4) SO_3
5) H_3O^+

096: Which substance contains the most electrophilic carbon atom?

1) Methane
2) Propane
3) Methyllithium
4) Carbon dioxide
5) Tetramethylsilane

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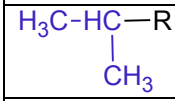
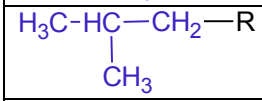
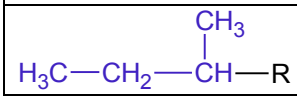
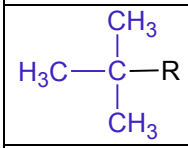
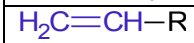
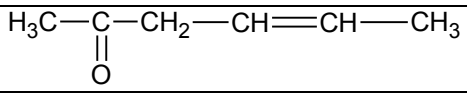
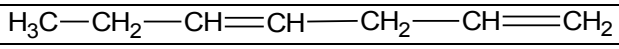
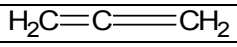
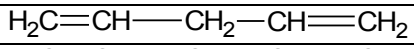
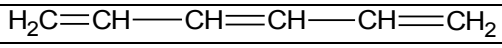
097: Which group is labelled *wrongly*?

Formula	Name	Trivial name
	1-methylethyl-	isopropyl-
	2-methylpropyl-	isobutyl-
	1-methylpropyl-	sec.-butyl-
	1,1-dimethylethyl-	tert.-butyl-
	Ethinyl-	vinyl-

098: Which compound possesses conjugated double bonds?

1	
2	
3	
4	
5	

099: Which characteristical type of bond is present in buta-1,3-diene?

1) Cumulated double bond
2) Single double bond
3) Triple double bond
4) Conjugated double bond
5) Isolated double bond

103: Which statement about the reaction that is basis for the synthesis of ammonia is correct?

1) The concentration of ammonia increases with increasing pressure
2) The concentration of ammonia does not change with increasing pressure
3) The concentration of ammonia decreases with increasing pressure
4) The concentration of ammonia does not change with increasing temperature
5) The concentration of ammonia increases with increasing temperature

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106: Which reaction is *unaffected* by changes in total pressure?

1) Hydrogen + Oxygen $\rightleftharpoons$ Water
2) Hydrogen + Chlorine $\rightleftharpoons$ Hydrogen chloride
3) Sulfur(IV)-oxide + Oxygen $\rightleftharpoons$ Sulfur(VI)-oxide
4) Nitrogen + Oxygen $\rightleftharpoons$ Nitrogen(I)-oxide
5) Carbonmonoxide + Oxygen $\rightleftharpoons$ Carbon dioxide

107: The reaction $H_2 + I_2 \rightleftharpoons 2\ HI$ is a balanced reaction. Which statement characterizes the equilibrium state?

1) In the equilibrium state the reaction is reversible (invertible)
2) In the equilibrium state no HI-molecules are formed anymore
3) In the equilibrium state exactly one half of the starting material have converted to hydrogen iodide
4) In the equilibrium state the starting material have completely been converted to hydrogen iodide
5) In the equilibrium state the number of forming HI-molecules is equal to the number of dissociating HI-molecules

108: Which answer states measures that are **all** capable of shifting the chemical equilibrium?

1) Change of temperature and pressure, application of a catalyst
2) Change of concentration, pressure and temperature
3) Change of concentration and pressure, application of a catalyst
4) Change of concentration and pressure, application of an inhibitor
5) Change of concentration and temperature, application of a catalyst

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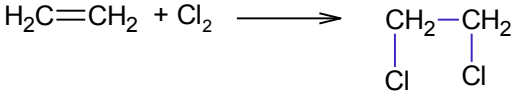
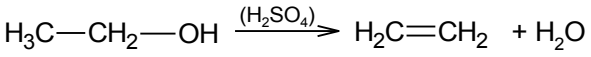
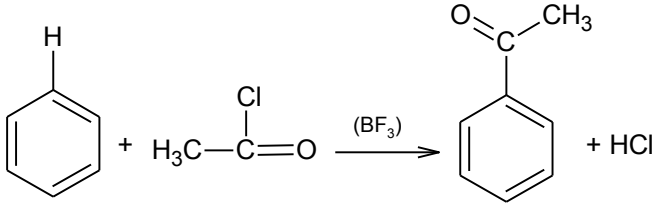
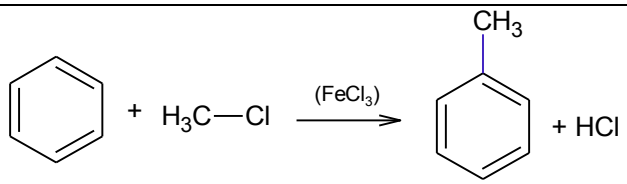
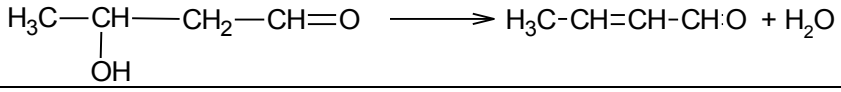
114: Which type of reaction is *miscalled*?

Type of reaction	Reaction equation
Chlorination	
Elimination	
Acetylation	
Alkylation	
Condensation	

115: What is understood by heterogeneous catalysis?

1) If catalytist and reactants have the same state of aggregation
2) If catalysis begins at al low initial temperature and then high temperatures occur within the reaction
3) If it is the synthesis of a heteropolar compound
4) If it is a heterocyclical compound
5) If catalytist and reactants are present in different phases

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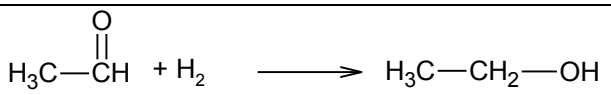
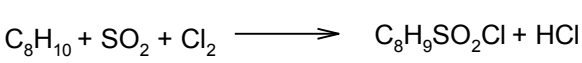
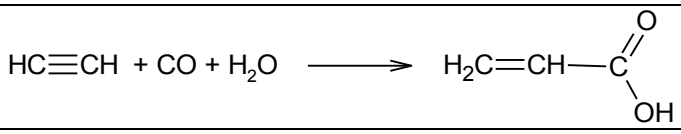
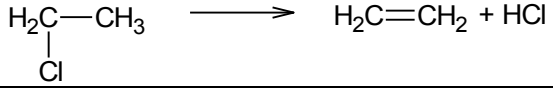
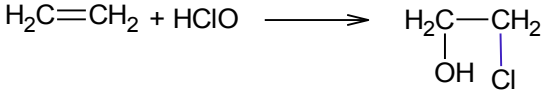
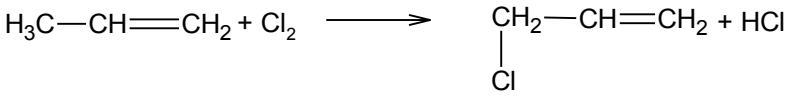
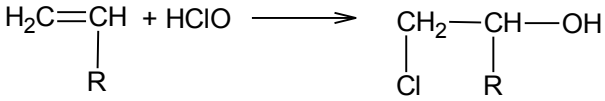
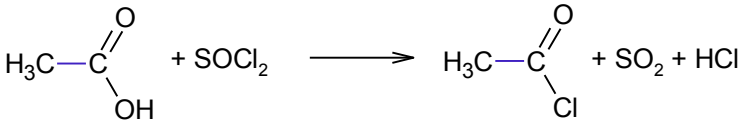
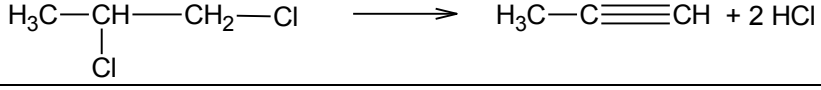
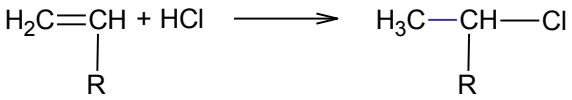
117: Which reaction equation describes a substitution reaction?

1	
2	
3	
4	
5	

119: Which reaction equation describes a hydrohalogenation?

1	
2	
3	
4	
5	

121: But-2-enal is formed from two mol ethanal. What kind of reaction type is it?

1) Condensation
2) Polycondensation
3) Elimination
4) Addition
5) Polymerisation

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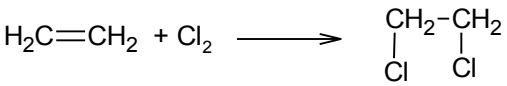
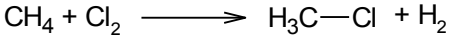
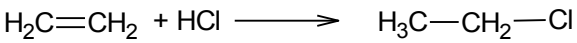
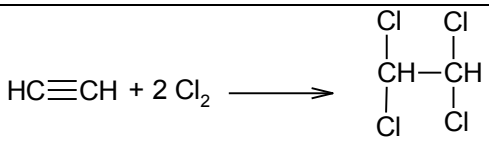
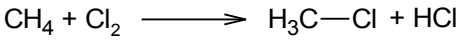
123: Which of the mentioned reactions is a substitution?

1) Hydration of alkenes
2) Nitration of aromates
3) Polymerisation of alkenes
4) Dehydration of alkanoles
5) Hydrohalogenation of alkines

124: Which type of reaction is the preparation of cyclohexene from cyclohexanol?

1) Dehydrogenation
2) Substitution
3) Dehydration
4) Reaarangement
5) Dehydrohalogenation

125: Which reaction equation describes correctly the chlorination of an alkane?

1	
2	
3	
4	
5	

132: Which conditions will lead predominantly to halogenation of side chains in aromatic compounds?

1) Catalytist, room temperature
2) Room temperature, UV light
3) UV light, heating
4) Catalytist, heating
5) Catalytist, UV light

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136: But-2-ene is hydrogenated. Which formula describes the arising compound?

1	$H_3C—CH_2—CH_2—CH_3$
2	$H_3C—CH_2—CH_2—CH_2—OH$
3	$H_3C—\underset{\displaystyle OH}{\underset{\vert}{CH}}—CH_2—CH_3$
4	$H_2C=CH—CH=CH_2$
5	$H_3C—CH\equiv CH—CH_2—OH$

137: Which type of reaction the following reaction is assigned to?

CH_3-MgI + H-O-C_2H_5 → CH_4 + Mg(OC_2H_5)I

1) Electrophilic addition (A_E)
2) Nucleophilic addition (A_N)
3) Nucleophilic substitution (S_N) on a saturated carbon atom
4) Radical substitution (S_R)
5) Electrophilic subsitution (S_E) on a saturated carbon atom

138: Which end product is obtained by the conversion of a ketone with a Grignard-compound and subsequent hydrolysis?

1) Carboxylic acid
2) Primary alcohol
3) Ketone
4) Tertiary alcohol
5) Secondary alcohol

139: Which starting materials are necessary for the preparation of the following ester?

$$H_3C—CH_2—\overset{\displaystyle O}{\overset{\Vert}{C}}—O—CH_2—CH_2—CH_3$$

1) Acetic acid and butan-1-ol
2) Propanoic acid and butan-1-ol
3) Propanoic acid and propan-1-ol
4) Butanoic acid and ethanol
5) Butanoic acid and propan-1-ol

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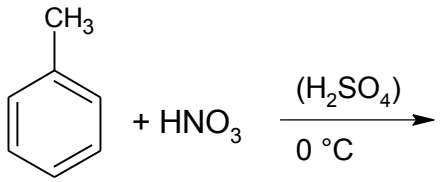
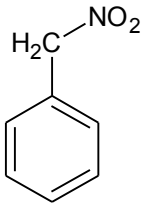
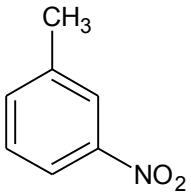
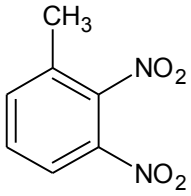
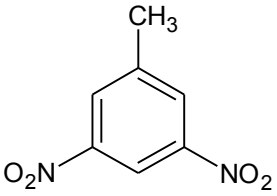
144: Which of the given compounds is formed **predominately** from the following reaction?

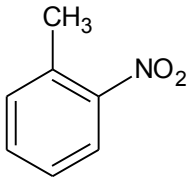


1) 

2) 

3) 

4) 

5) 

148: Which of the given compounds originates from the processing of 1 mol penta-1,3-diene with 1 mol hydrogen bromide?

2) 1-Brompent-2-ene
3) 4-Brompent-2-ene
4) 3-Brompent-1-ene
5) 1,2-Dibrompentane
6) 2,4-Dibrompentane

149: Which reaction equation describes a redox reaction?

1) $BaCl_2 + H_2SO_4 \rightarrow BaSO_4 + 2\ HCl$
2) $HCl + NaOH \rightarrow Na_2Cl + H_2O$
3) $Na_2SO_3 + H_2O_2 \rightarrow Na_2SO_4 + H_2O$
4) $H_2SO_4 + CaCO_3 \rightarrow CaSO_4 + H_2O + CO_2$
5) $NH_4Cl + NaOH \rightarrow NaCl + H_2O + NH_3$

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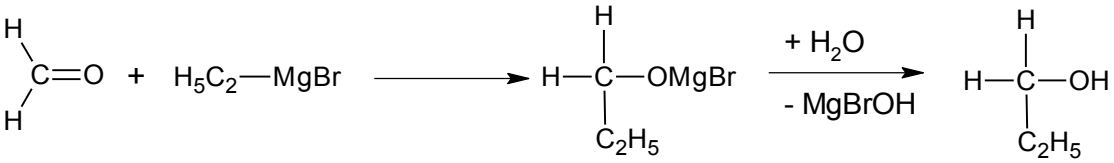
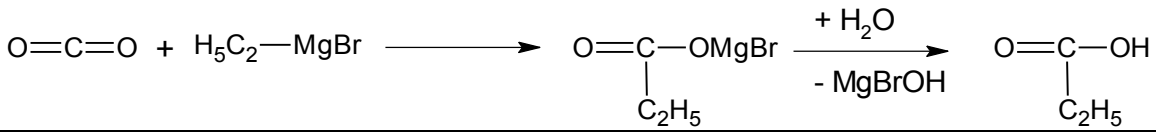
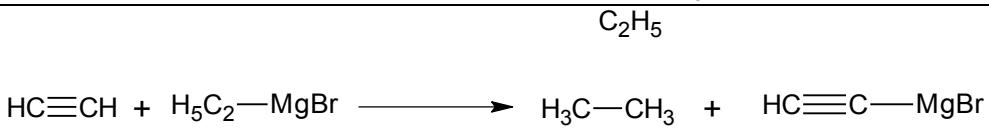
150: Which substance ***cannot*** be produced by the given reaction of a primary alkanol?

	Reaction of a primary alkanol	Substance
1)	Oxidation	Carboxylic acid
2)	Dehydration	Ether
3)	Hydrogenation	Epoxide
4)	Dehydration	Alkene
5)	Dehydrogenation	Aldehyde

152: Which of the following reactions is *not* possible?

1)	
2)	
3)	
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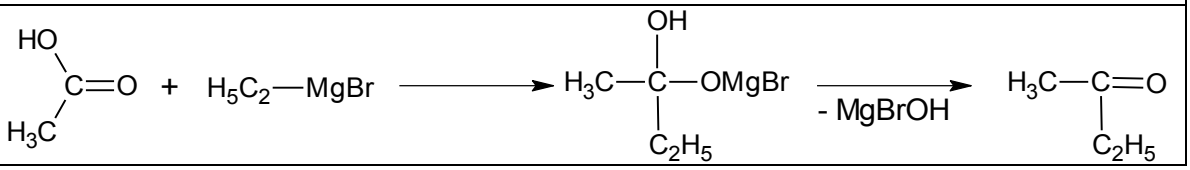
5)	

153: Which of the given products can *not* be obtained by hydrolysis of a fat using water vapour?

1) HO-CH_2-CH_2-OH
2) HO-CH_2-CH(OH)-CH_2-OH
3) $C_{15}H_{31}COOH$
4) $C_{17}H_{29}COOH$
5) $C_{17}H_{33}COOH$

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