Questions from the "PAL Prüfungsbuch"
Material Knowledge

070: In which of the reaction equations the blue reaction partner acts as a „Brönsted acid"?

1) $NH_4^+ + OH^- \rightarrow NH_3 + H_2O$
2) $Mg_2^+ + 2\ OH^- \rightarrow Mg(OH)_2$
3) $Mg_2^+ + 2\ OH^- \rightarrow Mg(OH)_2$
4) $NH_4^+ + OH^- \rightarrow NH_3 + H_2O$
5) $H_3O^+ + HCO_3^- \rightarrow CO_2 + 2\ H_2O$

071: In which of the reaction equations does HSO_4^- function as a „Brönsted base"?

1) $HSO_4^- + H_3O^+ \rightarrow H_2SO_4 + H_2O$
2) $HSO_4^- + OH^- \rightarrow SO_4^{2-} + H_2O$
3) $HSO_4^- + NH_3 \rightarrow SO_4^{2-} + NH_4^+$
4) $HSO_4^- + H_2O \rightarrow SO_4^{2-} + H_3O^+$
5) $HSO_4^- + Cl^- \rightarrow SO_4^{2-} + HCl$

072: Which of the reaction equations does *not* describe an acid-base-reaction?

1) $NaOH + HBr \rightarrow NaBr + H_2O$
2) $Ba(OH)_2 + H_2SO_4 \rightarrow BaSO_4 + 2\ H_2O$
3) $H_2O_2 + 2\ HI \rightarrow I_2 + 2\ H_2O$
4) $H_2CO_3 + Ca(OH)_2 \rightarrow CaCO_3 + 2\ H_2O$
5) $2\ HI + Mg(OH)_2 \rightarrow MgI_2 + 2\ H_2O$

075: Which statement regarding amino acids is correct?

1) In all amino acids the NH_2-group is bond to the second C-atom
2) Amino acids have low melting points
3) All α-amino acids are optically active
4) All α-amino acids are parts of proteins of living creatures
5) Short-chain amino acids are not easily soluble in water

076: What is the reason for the inertness of alkanes?

1) The symmetric structure
2) The unsaturated character
3) The highly delocalized electron pairs
4) The high binding energies
5) The pronounced electronegativity of the atoms

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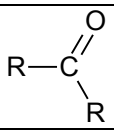
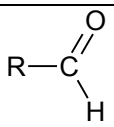
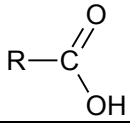
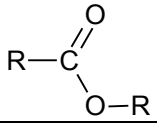
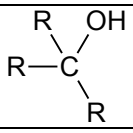
077: Which assignment of class of compounds and functional group is correct?

Class of compounds	Functional group
Alkanol (alcohol)	
Alkanal (aldehyde)	
Alkanone (ketone)	
Ether	
Carboxylic acid	

078: Which answer contains an **error?**

	Acid	Acid anhydride	Acid residue ion
1)	H_2SO_4	SO_3	SO_4^{2-}
2)	H_2SO_3	SO_2	SO_3^{2-}
3)	HNO_3	NO_2	NO_3^{-}
4)	H_2CO_3	CO_2	CO_3^{2-}
5)	H_3PO_4	P_2O_5	PO_4^{3-}

080: Of which compound does not exist an isomer?

1) CH_3-CO-CH_3
2) CHCl=CHCl
3) CH_3-O-CH_3
4) CHBr=CBr_2
5) CH_3-CH_2-OH

081: Which reaction equation is stoichiometrically correct?

1) 2 Fe + 3 O_2 → Fe_2O_3
2) CuO + 2 H_2 → H_2O + Cu
3) Al + HCl → $AlCl_3$
4) CO_2 + NaOH → Na_2CO_3
5) 2 Mg + O_2 → 2 MgO

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082: In which answer the reaction product is *wrong*?

1) Benzene + ethene → ethenebenzene
2) Benzene + halogen → halogenbenzene
3) Benzene + nitric acid → nitrobenzene
4) Benzene + propene → isopropylbenzene
5) Benzene + sulfuric acid → benzenesulfonic acid

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