Hydrogen ion concentration- *p*H scale and Buffer solution

161. The condition for minimum change in pH for a buffer solution is
(a) Isoelectronic species are added
(b) Conjugate acid or base is added
(c) $pH = pK_a$
(d) None of these

162. A buffer solution with $pH9$ is to be prepared by mixing NH_4Cl and NH_4OH. Calculate the number of moles of NH_4Cl that should be added to one litre of $1.0M$ NH_4OH. $[K_b = 1.8 \times 10^{-5}]$
(a) 3.4 (b) 2.6
(c) 1.5 (d) 1.8

163. The ionization constant of a certain weak acid is 10^{-4}. What should be the [salt] to [acid] ratio if we have to prepare a buffer with *pH* = 5 using this acid and one of the salts
(a) $1:10$ (b) $10:1$
(c) $5:4$ (d) $4:5$

164. Which solution has the highest *pH* value
(a) $1MKOH$
(b) $1MH_2SO_4$
(c) Chlorine water
(d) Water containing carbon dioxide

165. One weak acid (likeCH_3COOH) and its strong base together with salt (like CH_3COONa) is a buffer solution. In which pair this type of characteristic is found
(a) pH and $NaCl$
(b) $NaOH$ and $NaNO_3$
(c) KOH and KCl
(d) NH_4OH and NH_4Cl

166. If the *pH* of a solution of an alkali metal hydroxide is 13.6, the concentration of hydroxide is
(a) Between 0.1 *M* and 1 *M*
(b) More than 1 *M*
(c) Less than 0.001 *M*
(d) Between 0.01 *M* and 1 *M*

167. The pK_a of acetylsalicylic acid (aspirin) is 3.5. The pH of gastric juice in human stomach is about 2-3 and the pH in the small intestine is about 8. Aspirin will be
(a) Unionized in the small intestine and in the stomach
(b) Completely ionized in the small intestine and in the stomach
(c) Ionized in the stomach and almost unionized in the small intestine
(d) Ionized in the small intestine and almost unionized in the stomach

168. The concentration of hydrogen ion in water is

(a) 8 (b) 1×10^{-7}
(c) 7 (d) $1/7$

169. pH of a 10 M solution of HCl is
(a) Less than 0 (b) 2
(c) 0 (d) 1

170. The pH of $1NH_2O$ is
(a) 7 (b) >7
(c) <7 (d) 0

171. If H^+ ion concentration of a solution is increased by 10 times its *pH* will be
(a) Increase by one
(b) Remains unchanged
(c) Decrease by one
(d) Increase by 10

172. The gastric juice in our stomach contains enough HCl to make the hydrogen ion concentration about $0.01 mole/litre$. The pH of gastric juice is
(a) 0.01 (b) 1
(c) 2 (d) 14

173. Addition of which chemical will decrease the hydrogen ion concentration of an acetic acid solution
(a) NH_4Cl (b) $Al_2(SO_4)_3$
(c) $AgNO_3$ (d) HCN

174. The one which has the highest value of pH is
(a) Distilled water
(b) NH_3 solution in water
(c) NH_3
(d) Water saturated with Cl_2

175. The solution of Na_2CO_3 has pH
(a) Greater than 7
(b) Less than 7
(c) Equal to 7
(d) Equal to zero

176. Which is not a buffer solution
(a) $NH_4Cl + NH_4OH$
(b) $CH_3COOH + CH_3COONa$
(c) CH_3COONH_4
(d) Borax + Boric acid

177. What will be hydrogen ion concentration in moles $litre^{-1}$ of a solution, whose pH is 4.58
(a) 2.63×10^{-5}
(b) 3.0×10^{-5}
(c) 4.68
(d) None of these

178. Assuming complete dissociation, the pH of a 0.01 M $NaOH$ solution is equal to
(a) 2.0 (b) 14.0
(c) 12.0 (d) 0.01

179. 50 ml of $2N$ acetic acid mixed with $10ml$ of $1N$ sodium acetate solution will have an approximate pH of

(a) 4 (b) 5
(c) 6 (d) 7

180. The hydrogen ion concentration of 0.001 $MNaOH$ solution is
(a) $1 \times 10^{-2} mole/litre$
(b) $1 \times 10^{-11} mole/litre$
(c) $1 \times 10^{-14} mole/litre$
(d) $1 \times 10^{-12} mole/litre$

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