1.(5%)Following equation HB–→H++B2– what can the equilibrium constant be defined？

Ans:

2.(20%)How to make 100ml 1X10-4M “bromocresol green” solution(Molar mass 698.01 g·mol−1)？

Ans:

1.Measure 0.069801g bromocresol green, put in 100ml Volumetric flask, add a little EtOH then injection water to the scorelines.

2.Take 1ml1X10-3M“bromocresol green” solution, put in 10ml Volumetric flask, and injection water to the scorelines.

3.(20%)Weak acid **HA 0.5M** and its conjugate base **NaA 0.8M**，if we need to prepare pH=4.5 buffer solution **30mL**, how many HA ml sould we take？(Ka=6.4x10-4)

(A) 1.7509 **(B) 2.7509** (C) 3.7509 (D) 4.7509

Ans: (A)

HA=x ml , NaA=30- x ml

8.7245x=24 x=2.7509≒2.75

4.(15%)Which one conjugate pairs mixture will best fit pH=6~8 water solution？

(A)H2C2O4、NaHC2O4(H2C2O4 ka1=4X10-7, Ka2=5X10-11)

(B)CH3COOH、CH3COONa(CH3COOH Ka=2X10-5)

(C)NaHS、Na2S(H2S Ka1=1X10-7, Ka2=3X10-13)

(D) KH2PO4、Na2HPO4 (KH2PO4 pKa= 12.35, Na2HPO4 pKa = 6.86)

Ans: (D)

5.(15%)Why we chose “bromocresol green” and conjugate CH3COOH to do the experiment？

Ans: Because bromocresol green color change range is 3.8-5.4, and CH3COOH conjugate pairs buffer solution pH range will near 4.0~5.5.

6. (3%)What color change of Bromocresol green (BCG) from acid to base？

Ans: （黃yellow）3.8～5.4（藍綠blue-green）

7. (2%)Write down the Beer‐Lambert Law?

Ans：A = ε⋅b⋅c