

普通化學 試題 (限用答案本作答)

1. Describe how you would prepare  $5.00 \times 10^2$  mL of 1.75M  $\text{H}_2\text{SO}_4$  solution, starting with an 8.61M stock solution of  $\text{H}_2\text{SO}_4$ . (15%)
2. For the reaction
$$\text{N}_2(\text{g}) + 3\text{H}_2 = 2\text{NH}_3(\text{g})$$
 $K_p$  is  $4.3 \times 10^{-4}$  at  $375^\circ\text{C}$ . Calculate  $K_c$  for the reaction. (15%)
3. Which of these can form hydrogen bonds with water?  
 $\text{CH}_3\text{OCH}_3$ ,  $\text{CH}_4$ ,  $\text{F}^-$ ,  $\text{HCOOH}$ ,  $\text{Na}^+$ . (15%)
4. Write chemical formulas for cations and anions  
(a) aluminum (b) ammonium (c) calcium (d) iron(III)  
(e) chloride (f) fluoride (15%)
5. Calculate the pH of (a) a  $1.0 \times 10^{-3}$  M  $\text{HCl}$  solution and (b) a 0.05M  $\text{Ba}(\text{OH})_2$  solution (10%)
6. Predict and discuss whether these solutions will be acidic, basic, or nearly neutral: (a)  $\text{NH}_4\text{I}$  (b)  $\text{CaCl}_2$  (c)  $\text{KCN}$  (15%)
7. Calculate the molarity of a 0.396 m glucose ( $\text{C}_6\text{H}_{12}\text{O}_6$ ) solution. The molar of glucose is 180.2 g, and the density of the solution is 1.16 g/mL. (15%)

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