

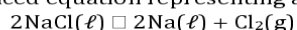
## Part A Questions

**August 2010**

9. The percent composition by mass of nitrogen in  $\text{NH}_4\text{OH}$  (gram-formula mass = 35 grams/mole) is equal to

- (1)  $\frac{4}{35} \times 100$                       (3)  $\frac{35}{14} \times 100$   
(2)  $\frac{14}{35} \times 100$                       (4)  $\frac{35}{4} \times 100$

36. Given the balanced equation representing a reaction:



A 1170.-gram sample of  $\text{NaCl}(\ell)$  completely reacts, producing 460. grams of  $\text{Na}(\ell)$ . What is the total mass of  $\text{Cl}_2(\text{g})$  produced?

- (1) 355 g   (2) 710. g   (3) 1420. g   (4) 1630. g

15. Which unit can be used to express the concentration of a solution?

- (1)  $\text{KOH}$    (2)  $\text{NH}_4\text{Cl}$    (3)  $\text{Na}_3\text{PO}_4$    (4)  $\text{PbSO}_4$

19. Petroleum can be separated by distillation because the hydrocarbons in petroleum are

- (1) elements with identical boiling points  
(2) elements with different boiling points  
(3) compounds with identical boiling points  
(4) compounds with different boiling points

24. Each of four test tubes contains a different concentration of  $\text{HCl}(\text{aq})$  at  $25^\circ\text{C}$ . A 1-gram cube of  $\text{Zn}$  is added to each test tube. In which test tube is the reaction occurring at the fastest rate?

- 1 M                      0.1 M                      0.01 M                      0.001 M  
 $\text{HCl}(\text{aq})$                        $\text{HCl}(\text{aq})$                        $\text{HCl}(\text{aq})$                        $\text{HCl}(\text{aq})$

27. Based on the results of testing colorless solutions with indicators, which solution is most acidic?

- (1) a solution in which bromthymol blue is blue  
(2) a solution in which bromcresol green is blue  
(3) a solution in which phenolphthalein is pink  
(4) a solution in which methyl orange is red

**June 2010**

34. A sample of an element has a mass of 34.261 grams and a volume of 3.8 cubic centimeters. To which number of significant figures should the calculated density of the sample be expressed?

- (1) 5                      (2) 2                      (3) 3                      (4) 4

14. The molarity of an aqueous solution of  $\text{NaCl}$  is defined as the

- (1) grams of  $\text{NaCl}$  per liter of water  
(2) grams of  $\text{NaCl}$  per liter of solution  
(3) moles of  $\text{NaCl}$  per liter of water  
(4) moles of  $\text{NaCl}$  per liter of solution

25. Which compound when dissolved in water is an Arrhenius acid?

- (1)  $\text{CH}_3\text{OH}$                       (2)  $\text{HCl}$                       (3)  $\text{NaCl}$                       (4)  $\text{NaOH}$

39. Which compound has the lowest vapor pressure at  $50^\circ\text{C}$ ?

- (1) ethanoic acid                      (2) ethanol  
(3) propanone                      (4) water

42. According to Table F, which compound is soluble in water?

- (1) barium phosphate                      (2) calcium sulfate  
(3) silver iodide                      (4) sodium perchlorate