

Name: _____ Pd: _____ Date: _____
SOL Review Packet

*******REMEMBER REVIEW IS TO HELP YOU LEARN WHAT ITEMS YOU HAVE TROUBLE WITH – DO NOT SKIP THE PROBLEMS YOU DO NOT UNDERSTAND, ASK FOR HELP!!!!**

Provide the answers to the following questions.

1. How many meters are in 1.5 kilometers? _____
2. How many grams are in 20 kilograms? _____
3. How many milliliters are in 3.7 liters? _____
4. How many milligrams are in 6.8 grams? _____

Write the following numbers in scientific notation.

5. 14,729 _____
6. 369 _____
7. 0.0059 _____

Give the number of significant figures in the following numbers.

8. 26,400 _____
9. 0.0140 _____

10. Round off 26,060 to three significant figures. _____

11. Solve and express your answer in scientific notation. _____

$$\frac{625 \times 5200}{0.0013 \times 0.025}$$

12. A group measures a quantity and the result is 25.9. The actual value is 25.6. What is the percent error in the measurement?

13. Find the density in g/cm^3 of a rectangular piece of granite which is 2.00cm x 2.0cm x 9.00cm and has a mass of 108g.

14. What amount of heat (in joules) would be produced by raising the temperature of 152 grams of water by 9°C ?

15. Find the percent composition of iron and oxygen in ferric oxide.
iron(III)

Complete the table below.

	Element	Atomic Number	Mass Number	Protons	Electrons	Neutrons
16.	Al	13	27			
17.	Be		9	4		
18.	Bi	83	209			
19.	Ca				20	20
20.	$^{13}_6\text{C}$			6		
21.	$^{21}_9\text{F}$			9		
22.	P^{3-}	15				
23.	Mg^{2+}		24			

Fill-in the blanks on the following table.

	Energy Level	Sublevel	Number of Orbitals	Maximum Number of Electrons
24.	1			
25.	2			
26.	3			
27.	4			

28. What elements are present in SF_6 ? _____ and _____
 29. How many atoms are in the formula above? _____

Write the formulas for the following.

30. sodium chloride _____ 37. sodium nitrate _____
 31. sodium sulfide _____ 38. sodium carbonate _____
 32. sodium phosphate _____

Name the following compounds.

33. KClO_3 _____
 34. $\text{Cu}(\text{NO}_2)_3$ _____
 35. KOH _____
 36. $\text{HBr}(\text{aq})$ _____

37. Calculate the empirical and molecular formula for the following compound.
38. Complete the following reaction:
 $2\text{C}_2\text{H}_2 + 5\text{O}_2 \rightarrow$ _____
39. How many atoms enter the reaction? ____ How many atoms leave the reaction? ____
40. How many molecules of carbon dioxide produced? _____
41. How many atoms of oxygen gas are consumed? _____

For questions 42-45 complete the word problem by predicting the product, write the balanced equation and identify the type of reaction.

42. Ammonia when heated produces _____
Type of reaction: _____
Equation: _____
43. Carbon reacts with ferric oxide produces _____
Type of reaction: _____
Equation: _____
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44. Chlorine gas and potassium bromide react to form _____
Type of reaction: _____
Equation: _____
45. Silver nitrate and sodium chloride react to form _____
Type of reaction: _____
Equation: _____

Find the mass in one mole of:

46. $\text{Hg}_2(\text{SO}_3)$
47. Al_2O_3
48. $\text{Ca}(\text{MnO}_4)_2$

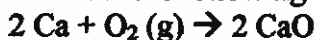
How many moles are in the following:

49. 98g of H_2SO_4
50. 7g of N_2
51. 0.051g of NH_3

Find the volumes of the following:

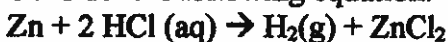
52. 1 mole of oxygen gas
53. 3.5 moles water
54. 10.0 moles of nitrogen gas

Consider the following equation:



55. How many moles of CaO would be produced by 3 moles of Ca?
56. How many grams of CaO would be produced by 54.3 grams of oxygen gas?
57. How many liters of oxygen gas would be needed to produce 23.7 grams of CaO?

Consider the following equation:



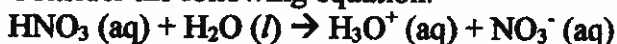
58. How many grams of Zn are needed to produce 11.2L of hydrogen gas?

Complete the following word problems.

59. A gas at STP occupies 4L, if the pressure was lowered to 560mmHg what would the new volume be?
60. The pressure exerted by a confined gas at 250K is 600 mmHg. What pressure would be exerted at 750K?
61. A gas at 4 atm and 350K occupies a volume of 52.3cm³, what is the new volume if we bring everything to STP?
62. How many grams of oxygen gas are present if it occupies 2.62L at 285°C and 3.42 atm?
63. We need to inflate a balloon to a volume of 1.250L with 0.2494g of helium, if the pressure is 1.26atm what temperature do we need (in °C)?
64. What is the molarity of a glucose solution if there is 0.20 mol of glucose dissolved in 750ml of water?

65. What is the molarity of hydrochloric acid if there are 25.3g of HCl dissolved in 5.00L of water?
66. What is the molality of a solution that is composed of 60.4g of potassium permanganate in 1200g of water?
67. What is the molality of a solution if there is 1.68 mol of KOH dissolved in 3.00kg of water?

Consider the following equation:



68. Identify the two conjugate pairs.

Pair 1: acid-_____ and base-_____

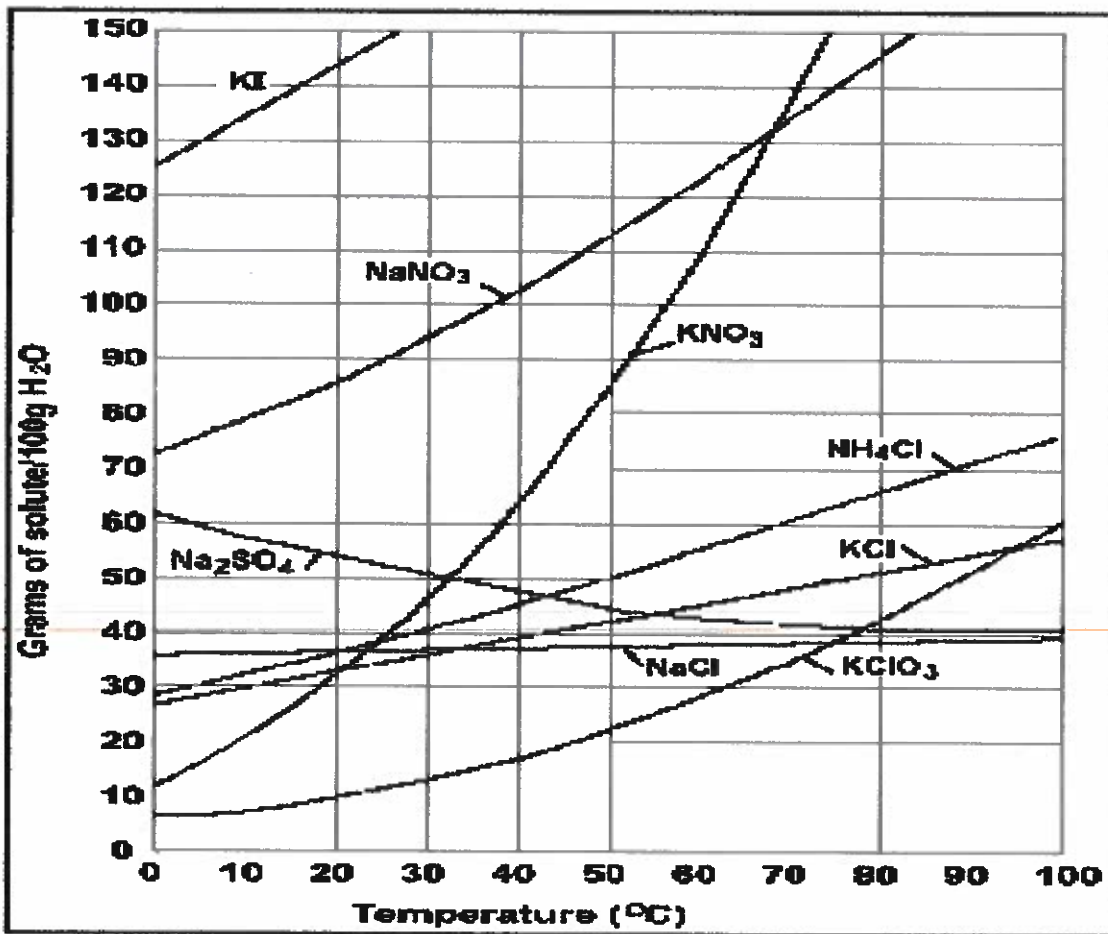
Pair 2: acid-_____ and base-_____

69. Which of the acids above fit the Arrhenius definition of an acid? _____
70. Calculate the hydroxide ion concentration of a solution whose hydronium ion concentration is 0.0010M.
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71. What is the pH of a solution if the concentration of hydronium ions is $1.0 \times 10^{-2}\text{M}$? Is the solution acidic or basic?
72. What is the pH of a solution if the hydroxide ion concentration is $1.0 \times 10^{-8}\text{M}$? Is the solution acidic or basic?

For the following questions use your knowledge of the periodic table.

73. Which of the following have the strongest metallic characteristics?
 a. francium b. fluorine c. magnesium d. hydrogen
74. Which of the following has the highest ionization energy?
 a. calcium b. neon c. carbon d. oxygen
75. Which of the following will have the strongest ionic bonds?
 a. F_2 b. NaCl c. H_2O d. CH_4
76. Which of the following will create a non-polar covalent bond?
 a. O_2 b. CaF_2 c. H_2O d. NH_3
77. Which of the following will have the smallest atomic radius?
 a. Na b. Cu c. Ne d. Cs

78. How many valence electrons does a neutral atom of Zinc have?
 a. 2 b. 4 c. 8 d. 12
79. How many energy levels does an atom of beryllium have?
 a. 1 b. 2 c. 3 d. 4

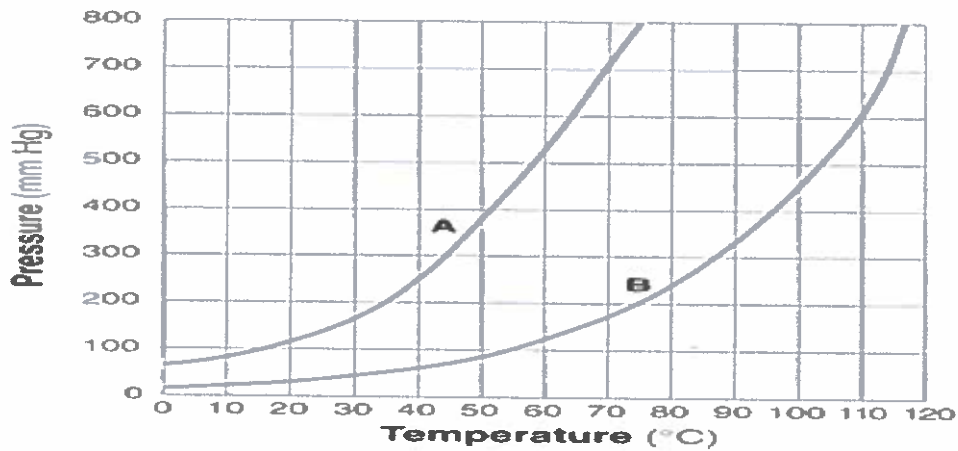


Use the graph above to answer the following questions.

80. At what temperature can you dissolve 145g of NaNO₃ in 100 grams of water?

81. How many grams of NH₄Cl can you dissolve in 100g of water at 90°C?

82. Typically solubility increases as the temperature increases, for which substance is this not true? _____

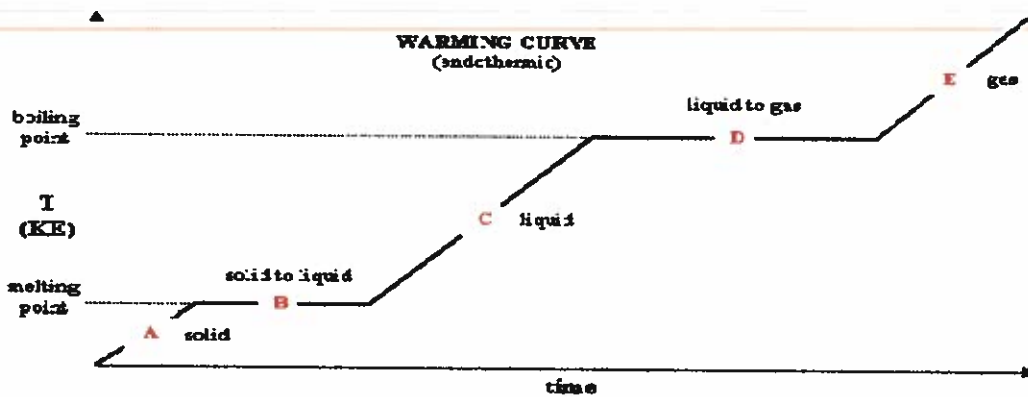


Use the graph above to answer the following questions.

83. If substance A is under a pressure of 700mmHg at what temperature will it boil?

84. At what pressure would substance B need to be if it is boiling at 110°C?

85. Which substance above has the weaker intermolecular forces? _____

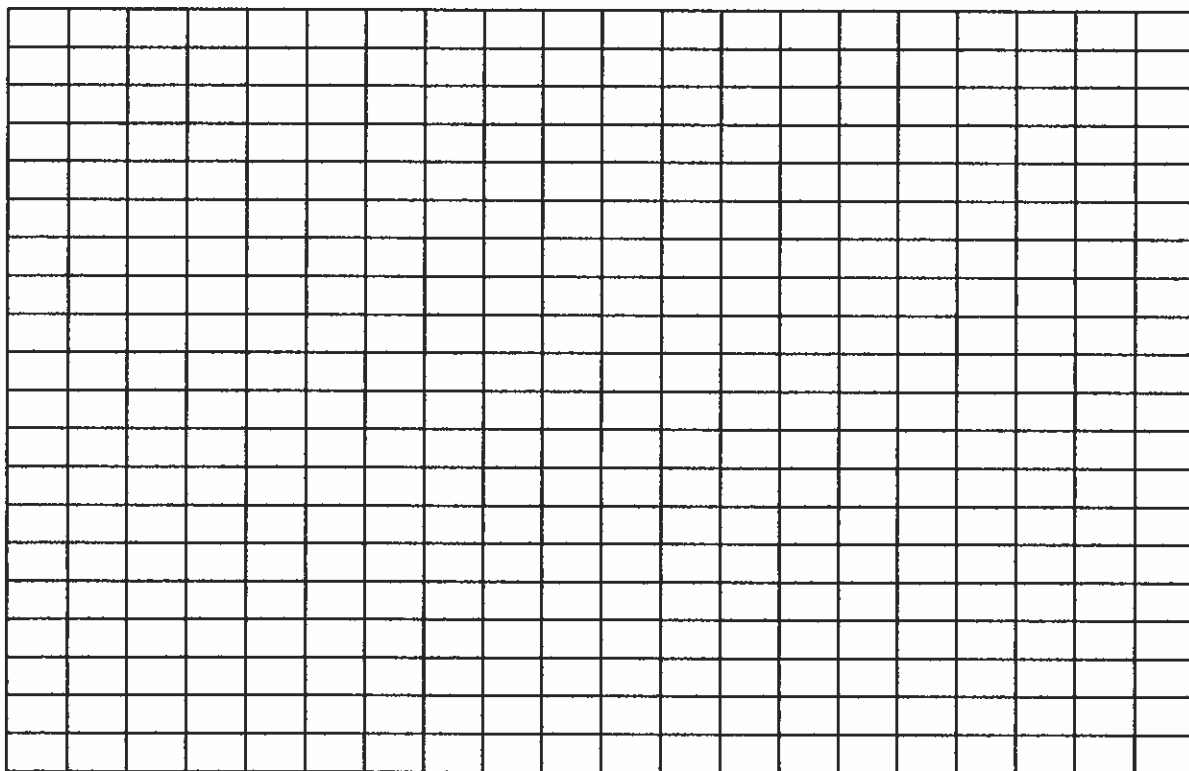


86. At what point would you measure the temperature of a substance that was freezing? _____

87. What would the temperature of water be if measured at point D? _____

88. Plot the following data on the graph provided. (next page) Be sure to include all needed labels!

Temperature (°C)	Volume (ml)
-40	465
-20	506
0	544
20	585
40	626



89. Using your graph, predict the volume at 10°C . _____

90. Determine the change in volume between -30°C and 30°C . _____