Student Name	:
Teacher:	Date:
District:	NCGaston
Assessment:	9_12 Science Chemistry Exam 3
Description:	Chemistry Mock Final Exam 2014-15
Form:	301

1. Shown below is a model of the structure of atom X.



Which is the atomic number of X?

A. 4

B. 6

C. 12

D. 18

2. Shown below is the Bohr model of sodium (Na):



Which is the correct ground state distribution of electrons in sodium in the electron shells labeled K, L, and M?

- A. 1, 2, 8
- B. 2, 8, 1
- C. 7, 8, 8
- D. 8, 8, 7
- 3. As an electron in a hydrogen atom moves from n = 4 to n = 2, which type of electromagnetic radiation is being emitted?
 - A. X-ray
 - B. visible light
 - C. infrared radiation
 - D. ultraviolet radiation
- 4. Which best represents the wavelength of light resulting from the transition of an electron from n = 4 to n = 2?
 - A. 410 nm
 - B. 434 nm
 - C. 486 nm
 - D. 656 nm

- **5.** A particular radioactive material has a half-life of 43 days. If a 95-gram sample has been decaying for 258 days, how much of the original sample is left?
 - A. 1.5 grams
 - B. 4.0 grams
 - C. 16 grams
 - D. 94 grams
- 6. Which represents the beta decay reaction of carbon-14 (C-14)?
 - A. ${}^{14}_{6}C \rightarrow {}^{0}_{\cdot 1}e + {}^{14}_{7}N$
 - B. ${}^{14}_{6}C \rightarrow {}^{-1}_{0}e + {}^{13}_{6}C$
 - C. ${}_{6}^{14}C \rightarrow {}_{2}^{4}He + {}_{8}^{10}O$
 - D. ${}_{6}^{14}C \rightarrow {}_{2}^{4}He + {}_{4}^{10}Be$
- 7. The table below provides physical characteristics of certain unidentified substances.

Substance	Melting Point (°C)	Boiling Point (°C)	Electrical Conductivity (in solid state)	Density (g/cm ³)
1	1084	2562	good	8.92
2	801	1465	poor	2.17
3	419	902	good	7.14
4	86	decomposes	poor	1.27

Physical Properties of Certain Substances

Which correctly matches a physical property of a substance and bond strength?

- A. Substance 1 has a high boiling point due to strong bonds.
- B. Substance 2 has poor electrical conductivity due to strong bonds.
- C. Substance 3 has a high melting point due to weak bonds.
- D. Substance 4 has a low density due to weak bonds.

8. The diagram below shows an oxygen molecule formed when two oxygen atoms bond.



Which is likely to be the nature of the bond that is formed?

- A. The molecule shares an electron pair to produce a single bond.
- B. The molecule shares two electron pairs to form a double bond.
- C. Two electrons are transferred to one oxygen atom to form an ionic bond.
- D. Two electrons are dispersed between two oxygen atoms to induce dipole bond.
- 9. Which is formed with ionic bonding?
 - A. SO₂
 - B. N₂O
 - C. SiO₂
 - D. Na₂O
- 10. The boiling points for the Group IV hydrides in descending order are shown.

 $SnH_4 > GeH_4 > SiH_4 > CH_4$

By what reasoning is this true?

- A. As the mass increases, so does the strength of the dipole-dipole interactions between nonpolar molecules.
- B. As the mass increases, so does the strength of the dispersion force acting between nonpolar molecules.
- C. As the mass increases, so does the strength of the hydrogen bonds acting between nonpolar molecules.
- D. As the mass increases, the intramolecular forces are greater than the intermolecular forces.

11. Which is the formula for calcium sulfate?

- A. CaS
- B. CaSO₃
- C. CaSO₄
- D. Ca(HSO₄)₂

12. A homework assignment states, 'Write the chemical formula for each compound in the table." A table is shown with a student's answers.

Compound	Formula
calcium bromide	CaBr ₂
iron (II) oxide	FeO2
potassium chloride	KCl ₂
sodium fluoride	NaF ₂

Which compound's formula has the student written correctly?

- A. calcium bromide
- B. iron (II) oxide
- C. potassium chloride
- D. sodium fluoride

13. Which molecular geometry is present in a molecule of hydrogen monosulfide, H₂S?

- A. bent
- B. tetrahedral
- C. trigonal planar
- D. trigonal pyramidal

14. The diagram below shows the spatial arrangement of NH₃.



What occupies the area marked Y?

- A. lone pair of electrons
- B. valence pairs of electron
- C. bonding pair of electrons
- D. repulsion pair of electrons

- **15.** Magnesium (Mg) is very chemically active. In solutions, it joins together with most nonmetals and almost every acid. Which element has chemical properties most similar to magnesium?
 - A. Al
 - B. B
 - C. Ca
 - D. Na
- 16. Which alkaline earth element has the largest atomic radius?
 - A. beryllium
 - B. calcium
 - C. magnesium
 - D. radium
- 17. What is the electron configuration for the element chlorine?
 - A. $1s^2 2s^2 1p^6 3s^2 2p^5$
 - B. $1s^2 2p^6 2s^2 3p^6 3s^1$
 - C. $1s^2 2s^2 2p^6 3s^2 3p^5$
 - D. $1s^2 2s^2 3s^2 2p^6 3p^5$

18. Which atom has the greatest electronegativity?

- A. arsenic
- B. germanium
- C. phosphorus
- D. silicon
- 19. Which process involves an increase in kinetic energy?
 - A. condensation
 - B. deposition
 - C. freezing
 - D. melting

20. Which phase change represents sublimation?

- A. $CO_2(s) \rightarrow CO_2(g)$
- B. $H_2O(l) \rightarrow H_2O(s)$
- C. $\operatorname{NaCl}(s) \rightarrow \operatorname{NaCl}(l)$
- D. $CH_3OH(l) \rightarrow CH_3OH(g)$

21. A heating curve for a pure substance is shown below:



Which is the boiling point for this substance?

- A. 30°C
- B. 70°C
- C. 140°C
- D. 180°C

22. What quantity of heat is needed to raise the temperature of 100. g of iron from 25°C to 1535°C?

- A. 19,500 J
- B. 67,800 J
- C. 68,900 J
- D. 631,000 J

23. The diagram represents a phase diagram for carbon dioxide.

Phase Diagram for Carbon Dioxide



Which must occur for the phase of carbon dioxide to change from region *Y* to region *X*?

- A. There must be a decrease in pressure only.
- B. There must be a decrease in temperature only.
- C. There must be a decrease in pressure and an increase in temperature.
- D. There must be an increase in pressure and a decrease in temperature.

24. Ten grams of water undergo a temperature change from 15.0°C to 0°C. Which explains what has occurred?

- A. 150 J of heat energy is lost.
- B. 627 J of heat energy is lost.
- C. 150 J of heat energy is gained.
- D. 627 J of heat energy is gained.

25. How many grams of ice will melt at 0°C if 275 J of heat energy is absorbed?

- A. 0.823 g
- B. 1.21 g
- C. 14.8 g
- D. 21.9 g

- **26.** A gas at STP has a volume of 37.8 L. If the temperature is raised to 22.0°C and the pressure is changed to 50.0 kPa, what is the new volume of the gas?
 - A. 2.81×10^{-1} L
 - B. 2.38 L
 - C. 5.61 L
 - D. 82.8 L
- 27. The diagram represents an energy pathway in a chemical reaction.



Which is being represented by *W* on the graph?

- A. product enthalpy
- B. reactant enthalpy
- C. activation energy
- D. activated complex

28. Which would represent the formation of a precipitate?

- A. Steam condenses on a cold mirror, forming droplets of water.
- B. A gas undergoes a phase change to produce a solid without becoming a liquid.
- C. Sodium chloride dissolves in water as polar water molecules pull ionic crystals apart.
- D. A solid forms when a solution of silver nitrate is mixed with a solution of sodium chloride.

- **29.** Aluminum powder burns in oxygen to produce aluminum oxide. Which represents a balanced equation of the reaction?
 - A. $Al + O_2 \rightarrow Al_2O_3$
 - B. $2Al + 2O_2 \rightarrow Al_2O_3$
 - C. $4Al + 2O_2 \rightarrow 2Al_2O_3$
 - D. $4Al + 3O_2 \rightarrow 2Al_2O_3$
- **30.** Bill used an apparatus to react ammonia and oxygen to produce water and nitrogen monoxide. The balanced reaction is shown below.

$$4NH_3 + 5O_2 \rightarrow 6H_2O + 4NO$$

If 21 moles of water are produced in this reaction, how many moles of nitrogen monoxide are also produced?

- A. 13.0 moles
- B. 14.0 moles
- C. 29 moles
- D. 32 moles
- **31.** How many moles are in 146 grams of CuSO₄?
 - A. 0.327 moles
 - B. 0.915 moles
 - C. 1.09 moles
 - D. 1.31 moles
- **32.** The chemical equation below shows the reaction of aluminum carbonate with water to form aluminum hydroxide and carbon dioxide.

$$Al_2(CO_3)_3 + 3H_2O \rightarrow 2Al(OH)_3 + 3CO_2$$

How many grams of aluminum carbonate must be used to produce 15.0 grams of aluminum hydroxide?

- A. 10.0 grams
- B. 22.5 grams
- C. 34.2 grams
- D. 45.0 grams

33. A chemistry experiment requires 2.00 moles of Ca(ClO₃)₂. How many grams of Ca(ClO₃)₂ are needed?

- A. 103 g
- B. 207 g
- C. 247 g
- D. 414 g

34. In which compound is the percentage of nitrogen the greatest?

- A. NO
- B. NH3
- C. AgNO3
- D. NaNO₂
- **35.** A scientist investigates the rate of reaction when combining Solution *X* and Solution *Y* during four different experiments, as shown in the table.

Experiment	Solution X Concentration	Solution Y Concentration
#1	0.5 M	0.6 M
#2	0.7 M	0.8 M
#3	0.9 M	1.0 M
#4	1.1 M	1.2 M

Which experiment probably had the fastest reaction rate?

- A. #1
- B. #2
- C. #3
- D. #4

36. Increasing the temperature of a reaction has what effect on the molecules involved?

- A. Their activation energy increases.
- B. Collisions between them increase.
- C. Their activation energy decreases.
- D. Collisions between them decrease.

- **37.** Which is true for a reaction in chemical equilibrium?
 - A. Both the rates of the forward and reverse reactions and the concentrations of the products and reactants are equal.
 - B. Both the rates of the forward and reverse reactions and the concentrations of the products and reactants are different.
 - C. The rates of the forward and reverse reactions are different, but the concentrations of the products and reactants are equal.
 - D. The rates of the forward and reverse reactions are equal, but the concentrations of the products and reactants may be different.
- 38. How will heating change the equilibrium for an exothermic reaction?
 - A. no change
 - B. shift to the left
 - C. shift to the right
 - D. slows the equilibrium reactions
- **39.** Ammonia is manufactured industrially using the Haber process with the reaction shown.

 $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$ $\Delta H = -92.2 \text{ kJ}$

Which action would result in a decrease of ammonia produced?

- A. removing heat
- B. adding hydrogen
- C. removing nitrogen
- D. raising the pressure

40. The concentration of hydrogen ions in a solution is 1.0×10^{-5} M. Which would represent the pOH of the solution?

- A. 5
- B. -5
- C. 9
- D. –9

41. How will a base affect the colors of the indicators listed?

- A. Blue litmus will turn red and phenolphthalein will turn pink.
- B. Red litmus will turn blue and phenolphthalein will turn pink.
- C. Blue litmus will turn red and phenolphthalein will become colorless.
- D. Red litmus will turn blue and phenolphthalein will become colorless.

42. Which is the molarity of a 1250 mL solution than contains 75.0 g of NaOH?

- A. 0.060 M
- B. 0.665 M
- C. 1.50 M
- D. 1.88 M
- **43.** A student prepares four different solutions using AlCl₃, CaCl₂, KNO₃, and (NH₄)2SO₄. The concentrations of all of the solutions are the same.

Which solution would have the least change in boiling point when compared to the boiling point of the solvent?

- A. AlCl₃
- B. CaCl₂
- C. KNO3
- D. (NH₄)₂SO₄

44. The diagram shows solubility curves for several inorganic compounds.



Which is a saturated solution in 100 g of H₂O?

- A. $10 \text{ g of } SO_2 \text{ at } 10^{\circ}C$
- B. 20 g of KCl at 60°C
- C. 80 g of KNO₃ at 50°C
- D. 30 g of NH₄Cl at 40°C

45. Which of the following will cause an increase in the solubility of a gas?

- A. stirring the solution
- B. increasing the pressure
- C. increasing the temperature
- D. increasing the surface area of the gas

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1. Shown below is a model of the structure of atom X.



Which is the atomic number of X? NCES.9_12.SC.CH.1.1.1 RBT: Understanding

A.	4
B.	6
C.	12
D.	18

2. Shown below is the Bohr model of sodium (Na):



Which is the correct ground state distribution of electrons in sodium in the electron shells labeled K, L, and M? NCES.9_12.SC.CH.1.1.2 RBT: Applying

A. 1, 2, 8
B. 2, 8, 1
C. 7, 8, 8
D. 8, 8, 7

3. As an electron in a hydrogen atom moves from n = 4 to n = 2, which type of electromagnetic radiation is being emitted? NCES.9_12.SC.CH.1.1.3 RBT: Applying

- A. X-ray
- B. visible light
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4. Which best represents the wavelength of light resulting from the transition of an electron from n = 4 to n = 2? NCES.9_12.SC.CH.1.1.3 RBT: Applying

- A. 410 nm
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5. A particular radioactive material has a half-life of 43 days. If a 95-gram sample has been decaying for 258 days, how much of the original sample is left?

NCES.9_12.SC.CH.1.1.4 RBT: Applying



- C. 16 grams
- D. 94 grams

6. Which represents the beta decay reaction of carbon-14 (C-14)? NCES.9_12.SC.CH.1.1.4 RBT: Applying

- A. ${}^{H}_{6}C \rightarrow {}^{0}_{.1}e + {}^{14}_{7}N$ B. ${}^{H}_{6}C \rightarrow {}^{-1}_{0}e + {}^{B}_{6}C$ C. ${}^{H}_{6}C \rightarrow {}^{4}_{2}He + {}^{B}_{8}O$
- D. ${}^{14}_{6}C \rightarrow {}^{4}_{2}He + {}^{10}_{4}Be$

7. The table below provides physical characteristics of certain unidentified substances.

Melting Point **Boiling Point** Electrical Conductivity Density Substance (°C) (in solid state) (g/cm3) (°C) 2562 8.92 1 1084 good 2 1465 2.17 801 poor 3 419 902 good 7.14 4 86 1.27 decomposes poor

Physical Properties of Certain Substances

Which correctly matches a physical property of a substance and bond strength? NCES.9_12.SC.CH.1.2.1 RBT: Analyzing

- A. Substance 1 has a high boiling point due to strong bonds.
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8. The diagram below shows an oxygen molecule formed when two oxygen atoms bond.



Which is likely to be the nature of the bond that is formed? NCES.9_12.SC.CH.1.2.2 RBT: Understanding

- A. The molecule shares an electron pair to produce a single bond.
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10. The boiling points for the Group IV hydrides in descending order are shown.

 $SnH_4 > GeH_4 > SiH_4 > CH_4$

By what reasoning is this true? NCES.9_12.SC.CH.1.2.3 RBT: Understanding

A. As the mass increases, so does the strength of the dipole–dipole interactions between nonpolar molecules.

- B. As the mass increases, so does the strength of the dispersion force acting between nonpolar molecules.
- C. As the mass increases, so does the strength of the hydrogen bonds acting between nonpolar molecules.
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11. Which is the formula for calcium sulfate? NCES.9_12.SC.CH.1.2.4 RBT: Understanding

A. CaS

B. CaSO₃



- D. Ca(HSO₄)₂
- **12.** A homework assignment states, 'Write the chemical formula for each compound in the table." A table is shown with a student's answers.

Compound	Formula
calcium bromide	CaBr ₂
iron (II) oxide	FeO ₂
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Which compound's formula has the student written correctly? NCES.9_12.SC.CH.1.2.4 RBT: Analyzing

A. calcium bromide

- B. iron (II) oxide
- C. potassium chloride
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13. Which molecular geometry is present in a molecule of hydrogen monosulfide, H₂S?

NCES.9_12.SC.CH.1.2.5 RBT: Analyzing

A. bent

- B. tetrahedral
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14. The diagram below shows the spatial arrangement of NH₃.



What occupies the area marked Y? NCES.9_12.SC.CH.1.2.5 RBT: Understanding

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NCES.9_12.SC.CH.1.3.1 RBT: Applying

A. Al B. B C. Ca D. Na

16. Which alkaline earth element has the largest atomic radius? NCES.9_12.SC.CH.1.3.2 RBT: Analyzing

- A. beryllium
- B. calcium
- C. magnesium
- D. radium

17. What is the electron configuration for the element chlorine? NCES.9_12.SC.CH.1.3.3 RBT: Applying

A. $1s^2 2s^2 1p^6 3s^2 2p^5$ B. $1s^2 2p^6 2s^2 3p^6 3s^1$ C. $1s^2 2s^2 2p^6 3s^2 3p^5$ D. $1s^2 2s^2 3s^2 2p^6 3p^5$

18. Which atom has the greatest electronegativity? NCES.9_12.SC.CH.1.3.3 RBT: Applying

- A. arsenic
- B. germanium
- C. phosphorus
- D. silicon

19. Which process involves an increase in kinetic energy? NCES.9_12.SC.CH.2.1.1 RBT: Applying

- A. condensation
- B. deposition
- C. freezing
- D. melting

20. Which phase change represents sublimation? NCES.9_12.SC.CH.2.1.1 RBT: Understanding

A. $\operatorname{CO}_2(s) \to \operatorname{CO}_2(g)$

- B. $H_2O(l) \rightarrow H_2O(s)$
- C. $\operatorname{NaCl}(s) \to \operatorname{NaCl}(l)$
- D. $CH_3OH(l) \rightarrow CH_3OH(g)$

21. A heating curve for a pure substance is shown below:



Which is the boiling point for this substance? NCES.9_12.SC.CH.2.1.2 RBT: Analyzing

A.	30°C
В.	70°C
C.	140°C
D.	180°C

22. What quantity of heat is needed to raise the temperature of 100. g of iron from 25°C to 1535°C? NCES.9_12.SC.CH.2.1.2 RBT: Applying

A.	19,500 J
B.	67,800 J
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23. The diagram represents a phase diagram for carbon dioxide.

Phase Diagram for Carbon Dioxide



Which must occur for the phase of carbon dioxide to change from region *Y* to region *X*? NCES.9_12.SC.CH.2.1.3 RBT: Analyzing

A. There must be a decrease in pressure only.

B. There must be a decrease in temperature only.

- C. There must be a decrease in pressure and an increase in temperature.
- D. There must be an increase in pressure and a decrease in temperature.

24. Ten grams of water undergo a temperature change from 15.0°C to 0°C. Which explains what has occurred? NCES.9_12.SC.CH.2.1.4 RBT: Understanding

- A. 150 J of heat energy is lost.
- B. 627 J of heat energy is lost.
- C. 150 J of heat energy is gained.
- D. 627 J of heat energy is gained.

25. How many grams of ice will melt at 0°C if 275 J of heat energy is absorbed? NCES.9_12.SC.CH.2.1.4 RBT: Applying

- A. 0.823 g
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- C. 14.8 g
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NCES.9_12.SC.CH.2.1.5 RBT: Applying

A. 2.81×10^{-1} L B. 2.38 L C. 5.61 L D. 82.8 L

27. The diagram represents an energy pathway in a chemical reaction.



Which is being represented by *W* on the graph? NCES.9_12.SC.CH.2.2.1 RBT: Understanding

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- B. reactant enthalpy
- C. activation energy
- D. activated complex

28. Which would represent the formation of a precipitate? NCES.9_12.SC.CH.2.2.2 RBT: Analyzing

- A. Steam condenses on a cold mirror, forming droplets of water.
- B. A gas undergoes a phase change to produce a solid without becoming a liquid.
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- D. A solid forms when a solution of silver nitrate is mixed with a solution of sodium chloride.

29. Aluminum powder burns in oxygen to produce aluminum oxide. Which represents a balanced equation of the reaction? NCES.9_12.SC.CH.2.2.3 RBT: Applying

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- B. $2Al + 2O_2 \rightarrow Al_2O_3$
- C. $4Al + 2O_2 \rightarrow 2Al_2O_3$
- D. $4Al + 3O_2 \rightarrow 2Al_2O_3$
- **30.** Bill used an apparatus to react ammonia and oxygen to produce water and nitrogen monoxide. The balanced reaction is shown below.

 $4NH_3 + 5O_2 \rightarrow 6H_2O + 4NO$

If 21 moles of water are produced in this reaction, how many moles of nitrogen monoxide are also produced? NCES.9_12.SC.CH.2.2.4 RBT: Applying

- A. 13.0 moles
- B. 14.0 moles
- C. 29 moles
- D. 32 moles

31. How many moles are in 146 grams of CuSO₄? NCES.9_12.SC.CH.2.2.4 RBT: Applying

- A. 0.327 moles
- B. 0.915 moles
- C. 1.09 moles
- D. 1.31 moles

32. The chemical equation below shows the reaction of aluminum carbonate with water to form aluminum hydroxide and carbon dioxide.

 $Al_2(CO_3)_3 + 3H_2O \rightarrow 2Al(OH)_3 + 3CO_2$

How many grams of aluminum carbonate must be used to produce 15.0 grams of aluminum hydroxide? NCES.9_12.SC.CH.2.2.4 RBT: Applying

A. 10.0 grams
B. 22.5 grams
C. 34.2 grams
D. 45.0 grams

33. A chemistry experiment requires 2.00 moles of Ca(ClO₃)₂. How many grams of Ca(ClO₃)₂ are needed? NCES.9_12.SC.CH.2.2.4 RBT: Applying

- A. 103 g
- B. 207 g
- C. 247 g
- D. 414 g

34. In which compound is the percentage of nitrogen the greatest? NCES.9_12.SC.CH.2.2.5 RBT: Analyzing

- A. NOB. NH₃C. AgNO₃
- D. NaNO₂

35. A scientist investigates the rate of reaction when combining Solution *X* and Solution *Y* during four different experiments, as shown in the table.

Experiment	Solution X Concentration	Solution Y Concentration
#1	0.5 M	0.6 M
#2	0.7 M	0.8 M
#3	0.9 M	1.0 M
#4	1.1 M	1.2 M

Which experiment probably had the fastest reaction rate? NCES.9_12.SC.CH.3.1.1 RBT: Analyzing

A. #1
B. #2
C. #3
D. #4

36. Increasing the temperature of a reaction has what effect on the molecules involved? NCES.9_12.SC.CH.3.1.1 RBT: Applying

- A. Their activation energy increases.
- B. Collisions between them increase.
- C. Their activation energy decreases.
- D. Collisions between them decrease.

37. Which is true for a reaction in chemical equilibrium? NCES.9_12.SC.CH.3.1.2 RBT: Analyzing

- A. Both the rates of the forward and reverse reactions and the concentrations of the products and reactants are equal.
- Both the rates of the forward and reverse reactions and the concentrations of the products and reactants are different.
 C. The rates of the forward and reverse reactions are different, but the concentrations of the products and reactants are equal.
- D. The rates of the forward and reverse reactions are equal, but the concentrations of the products and reactants may be different.

38. How will heating change the equilibrium for an exothermic reaction? NCES.9_12.SC.CH.3.1.3 RBT: Analyzing

A. no change

B. shift to the left

C. shift to the right

D. slows the equilibrium reactions

39. Ammonia is manufactured industrially using the Haber process with the reaction shown.

 $N_2(g) + 3H_2(g) \Longrightarrow 2NH_3(g) \qquad \Delta H = -92.2 \text{ kJ}$

Which action would result in a decrease of ammonia produced?

NCES.9_12.SC.CH.3.1.3 RBT: Analyzing

- A. removing heat
- B. adding hydrogen
- C. removing nitrogen
- D. raising the pressure

40. The concentration of hydrogen ions in a solution is 1.0×10^{-5} M. Which would represent the pOH of the solution? NCES.9_12.SC.CH.3.2.1 RBT: Analyzing

A. 5 B. -5 C. 9 D. -9

41. How will a base affect the colors of the indicators listed? NCES.9_12.SC.CH.3.2.2 RBT: Applying

- A. Blue litmus will turn red and phenolphthalein will turn pink.
- B. Red litmus will turn blue and phenolphthalein will turn pink.
- C. Blue litmus will turn red and phenolphthalein will become colorless.
- D. Red litmus will turn blue and phenolphthalein will become colorless.

42. Which is the molarity of a 1250 mL solution than contains 75.0 g of NaOH? NCES.9_12.SC.CH.3.2.3 RBT: Applying

A.	0.060 M
В.	0.665 M
C.	1.50 M
D.	1.88 M

43. A student prepares four different solutions using AlCl₃, CaCl₂, KNO₃, and (NH₄)2SO₄. The concentrations of all of the solutions are the same.

Which solution would have the least change in boiling point when compared to the boiling point of the solvent? NCES.9_12.SC.CH.3.2.4 RBT: Analyzing

- A. AlCl₃
- B. CaCl₂
- C. KNO₃
- D. $(NH_4)_2SO_4$

44. The diagram shows solubility curves for several inorganic compounds.



Which is a saturated solution in 100 g of H₂O? NCES.9_12.SC.CH.3.2.5 RBT: Analyzing

- A. 10 g of SO₂ at 10°C
- B. 20 g of KCl at 60°C
- C. 80 g of KNO₃ at 50°C
- D. 30 g of NH₄Cl at 40°C

45. Which of the following will cause an increase in the solubility of a gas? NCES.9_12.SC.CH.3.2.6 RBT: Applying

- A. stirring the solution
- B. increasing the pressure
- C. increasing the temperature
- D. increasing the surface area of the gas