

NAME \_\_\_\_\_ Period: \_\_\_\_\_ Date: \_\_\_\_\_

Ms. Randall

**"IN TERMS OF..."** Chemistry Regents Review

**Two isotopes of potassium are listed below.**



1. State one similarity between potassium-37 and potassium-42 *in terms of subatomic particles*.
2. *In terms of subatomic particles*, state one difference.
3. Compare  ${}^{37}\text{K}$  and  ${}^{42}\text{K}$  *in terms of radioactive decay*.
4. *In terms of half life*, how are  ${}^{37}\text{K}$  and  ${}^{42}\text{K}$  different?

**Given the following equilibrium reaction:**



5. *In terms of the collision theory*, state why adding extra  $\text{N}_2$  produces more  $\text{NH}_3$
6. *In terms of LeChatelier's principle*, state why adding extra  $\text{N}_2$  produces more  $\text{NH}_3$
7. In terms of *ground state, excited state, and energy transitions*, explain how a bright line spectrum is produced.
8. State the relationship between *molar mass* and boiling points
9. State the relationship between *intermolecular forces* and boiling points
10. *In terms of valence electrons*, why is Li more like Fr than Be?
11. *In terms of chemical activity*, why is Ba more like Fr than Be?

**When NaCl is dissolved in water, the temperature of the solution decreases.**

12. Explain this statement *in terms of heat flow*.

13. Explain this statement *in terms of average kinetic energy*.

**NaCl has a higher melting point than C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>**

14. Explain this statement *in terms bonding*.

15. Explain this statement *in terms of intermolecular forces*.

16. *In terms of valence electrons*, explain why copper is a conductor.

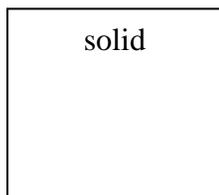
17. *In terms of location on the periodic table*, explain why copper is a conductor.

18. CH<sub>4</sub> will not dissolve in water, but NH<sub>3</sub> will dissolve in water. Explain the solubility of NH<sub>3</sub> *in terms of molecule polarity*. Include both water and NH<sub>3</sub> in the answer.

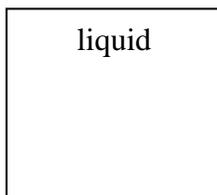
**Chemical X has a boiling point of 75 °C**  
**Chemical Y has a boiling point of 126 °C**

23. Explain this difference in boiling points *in terms of intermolecular forces*.

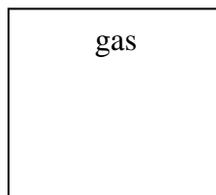
24. Explain this difference in boiling points *in terms of heats of vaporization*.



**A**



**B**



**C**

19. Name the phase change from A to B

20. Explain the difference in particles from A to B *in terms of energy*.

21. Explain the change from A to B *in terms of particle arrangement*.

22. Explain the difference between A and B *in terms of intermolecular forces*.

**Two isotopes of potassium are listed below.**



1. State one similarity between potassium-37 and potassium-42 *in terms of subatomic particles.*  
potassium-37 and potassium-42 have the same number of protons
2. *In terms of subatomic particles,* state one difference.  
potassium-37 and potassium-42 have different numbers of neutrons
3. Compare  ${}^{37}\text{K}$  and  ${}^{42}\text{K}$  *in terms of radioactive decay.*  
 ${}^{37}\text{K}$  and  ${}^{42}\text{K}$  have different decay modes  
 ${}^{37}\text{K}$  is positron decay and  ${}^{42}\text{K}$  is beta decay
4. *In terms of half life,* how are  ${}^{37}\text{K}$  and  ${}^{42}\text{K}$  different?  
 ${}^{37}\text{K}$  and  ${}^{42}\text{K}$  have different half lives  
 ${}^{37}\text{K}$  has a half life of 1.23 seconds and  ${}^{42}\text{K}$  has a half life of 12.4 hrs

**Given the following equilibrium reaction:**



5. *In terms of the collision theory,* state why adding extra  $\text{N}_2$  produces more  $\text{NH}_3$   
more  $\text{N}_2$  molecules means more molecules present to potentially collide, thus producing more  $\text{NH}_3$
6. *In terms of LeChatelier's principle,* state why adding extra  $\text{N}_2$  produces more  $\text{NH}_3$   
adding  $\text{N}_2$  makes the equilibrium reaction shift to relieve this stress, thus producing more  $\text{NH}_3$
7. In terms of *ground state, excited state, and energy transitions,* explain how a bright line spectrum is produced. When an electron returns to the ground state from the excited state, energy is released, thus producing a visible bright line spectrum
8. State the relationship between *molar mass* and boiling points  
Larger molar mass, higher boiling point (in general)
9. State the relationship between *intermolecular forces* and boiling points  
Stronger intermolecular forces, higher boiling point
10. *In terms of valence electrons,* why is Li more like Fr than Be?  
Li has the same number of valence electrons as Fr and not the same as Be
11. *In terms of chemical activity,* why is Ba more like Fr than Be?  
Ba is at the bottom of a metal family where the more active metals are located, as is Fr, and Be is at the top, where less active metals are located

**When NaCl is dissolved in water, the temperature of the solution decreases.**

12. Explain this statement *in terms of heat flow.*  
Heat flows from high heat to low heat and in this case from the solution into the NaCl

13. Explain this statement *in terms of average kinetic energy*.

The average kinetic energy of the solution has decreased

**NaCl has a higher melting point than C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>**

14. Explain this statement *in terms bonding*.

NaCl is an ionic substance, which have higher melting points than covalently bonded substances

15. Explain this statement *in terms of intermolecular forces*.

NaCl must have stronger intermolecular forces than the C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>, causing a higher melting point

16. *In terms of valence electrons*, explain why copper is a conductor.

Cu is a conductor because it has loosely held electrons which are free to move (conduct)

17. *In terms of location on the periodic table*, explain why copper is a conductor.

Cu is a conductor because it is on the metal side of the periodic table and metals are conductors

18. CH<sub>4</sub> will not dissolve in water, but NH<sub>3</sub> will dissolve in water. Explain the solubility of NH<sub>3</sub> *in terms of molecule polarity*. Include both water and NH<sub>3</sub> in the answer.

Water is a polar molecule and NH<sub>3</sub> is also a polar molecule. Molecules of similar polarities will dissolve in each other.

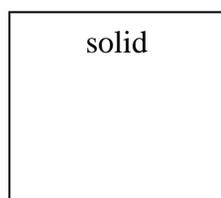
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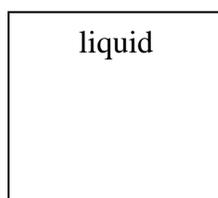
Chemical X has weaker intermolecular forces than Chemical Y

24. Explain this difference in boiling points *in terms of heats of vaporization*.

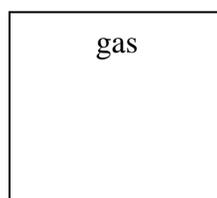
Chemical X has a lower heat of vaporization than Chemical Y



**A**



**B**



**C**

19. Name the phase change from A to B

melting

20. Explain the difference in particles from A to B *in terms of energy*.

energy is increasing from A to B

21. Explain the change from A to B *in terms of particle arrangement*.

from A to B, the particles are spreading out

from A to B, the particles are less organized and do not have a rigid arrangement

22. Explain the difference between A and B *in terms of intermolecular forces*.

the intermolecular forces in A are stronger than in B