

Random HW #9 — Twenty Random Regents questions, word for word, Jan 2018

31 An ion that consists of 7 protons, 9 neutrons, and 10 electrons has a net charge of  
 1. 2-                      2. 2+                      3. 3+                      4. 3-

32 Which electron configuration represents the electrons of an atom in an excited state?  
 1. 2-2                      2. 2-2-1                      3. 2-8                      4. 2-8-1

33 This table gives the atomic mass and the abundance of the two naturally occurring isotopes of boron.

Naturally Occurring Isotopes of Boron		
Isotope	Atomic Mass (u)	Natural Abundance (%)
B-10	10.01	19.9
B-11	11.01	80.1

Which numerical setup can be used to determine the atomic mass of the element boron?

1.	$\frac{(10.01 \text{ u})(19.9) + (11.01 \text{ u})(80.1)}{100}$	3	$\frac{(10.01 \text{ u}) + (11.01 \text{ u})}{2}$
2.	$\frac{(10.01 \text{ u})(0.199) + (11.01 \text{ u})(.801)}{100}$	4	$\frac{19.9\% + 80.1\%}{2}$

34 In which group on the Periodic Table would a nonmetallic element belong if atoms of this element tend to gain two electrons to complete their valence shell?    1. 14                      2. 15                      3. 16                      4. 17

35 Which trend is observed as the first four elements in Group 17 on the Periodic Table are considered in order of increasing atomic number?  
 1. Electronegativity increases.                      3. The number of valence electrons increases.  
 2. First ionization energy decreases.                      4. The number of electron shells decreases.

36 What is the number of moles of KF in a 29-gram sample of the compound?  
 1. 1.0 mol                      2. 2.0 mol                      3. 0.50 mol                      4. 5.0 mol

37 Which bond is most polar?    1. C-O                      2. H-O                      3. N-O                      4. S-O

38 Based on Table F, which equation represents a saturated solution having the lowest concentration of  $\text{Cl}^{-1}$  ions?

1.	$\text{NaCl}_{(s)}$	$\rightleftharpoons$	$\text{Na}^{+1}_{(aq)} + \text{Cl}^{-1}_{(aq)}$
2.	$\text{AgCl}_{(s)}$	$\rightleftharpoons$	$\text{Ag}^{+1}_{(aq)} + \text{Cl}^{-1}_{(aq)}$
3.	$\text{NH}_4\text{Cl}_{(s)}$	$\rightleftharpoons$	$\text{NH}_4^{+1}_{(aq)} + \text{Cl}^{-1}_{(aq)}$
4.	$\text{KCl}_{(s)}$	$\rightleftharpoons$	$\text{K}^{+1}_{(aq)} + \text{Cl}^{-1}_{(aq)}$

39 What is the molarity of a solution that contains 0.500 mole of  $\text{KNO}_3$  dissolved in 0.500-liter of solution?

1. 1.00 M      2. 2.00 M      3. 0.500 M      4. 4.00 M

40 Given:      Sample 1: 100. grams of water at  $10.^{\circ}\text{C}$       Sample 2: 100. grams of water at  $20.^{\circ}\text{C}$

Compared to sample 1, sample 2 contains

- molecules with a lower average kinetic energy
- molecules with a lower average velocity
- less heat energy
- more heat energy



41. Given the key (below), which particle diagram represents a chemical change?

Key	
	= an atom of element A
	= an atom of element Z

42 Based on Table H, what is the vapor pressure of  $\text{CH}_3\text{COOH}$  at  $90.^{\circ}\text{C}$ ?

1. 40. kPa      2. 48 kPa      3. 114 kPa      4. 150. kPa

43 The arrangement of particles is most ordered in a sample of

1.  $\text{NaCl}_{(aq)}$       2.  $\text{NaCl}_{(l)}$       3.  $\text{NaCl}_{(g)}$       4.  $\text{NaCl}_{(s)}$

44 What is the net amount of heat released when two moles of  $\text{C}_2\text{H}_6(g)$  are formed from its elements at

- 101.3 kPa and 298 K?      1. 42.0 kJ      2. 84.0 kJ      3. 126.0 kJ      4. 168.0 kJ

45 Which compounds are isomers of each other?

1. methanol and methanal
2. propanoic acid and pentanoic acid
3. 1-propanol and 2-propanol
4. 1-chloropropane and 2-bromopropane

46 A reaction between an alcohol and an organic acid is classified as

1. esterification
2. fermentation
3. saponification
4. substitution

47 Why is potassium nitrate classified as an electrolyte?

1. It is a molecular compound.
2. It contains a metal.
3. It can conduct electricity as a solid.
4. It releases ions in an aqueous solution.

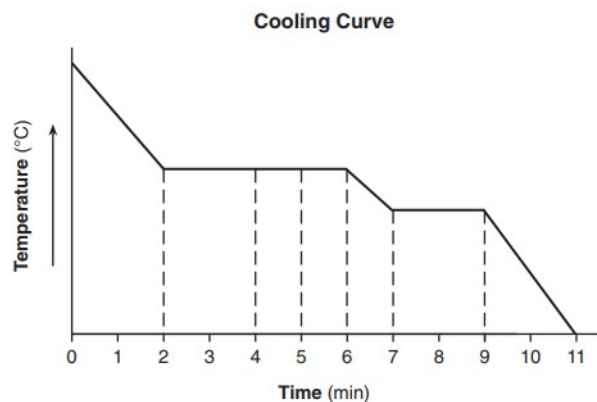
48 When the concentration of hydrogen ions in a solution is decreased by a factor of ten, the pH of the solution

1. increases by 1
2. increases by 10
3. decreases by 1
4. decreases by 10

49 The cooling curve represents the uniform cooling of a substance, starting at a temperature above its boiling point.

During which time interval does the substance exist as both a liquid and a solid?

1. min 2 to min 4
2. min 4 to min 5
3. min 5 to min 7
4. min 7 to min 9



50 Given this balanced equation:  $\text{CH}_{4(\text{G})} + 2\text{O}_{2(\text{G})} \rightarrow \text{CO}_{2(\text{G})} + 2\text{H}_2\text{O}_{(\text{G})} + \text{energy}$

Which change in reaction conditions will increase the frequency of effective collisions between reactant molecules?

1. decreasing the pressure of the reactants
2. decreasing the temperature of the reactants
3. increasing the concentration of the reactants
4. increasing the volume of the reactants