Honors Chemistry Final Exam 2020 Dooner/Carmel High

INSTRUCTIONS: Place all answers only(A,B,C, etc) on a single piece of paper and email back to me. Show all work on separate sheets of paper. This test is open book, open note, and open source and you can use any resources(including my reviews) that are linked to the Moodle. It is **NOT collaborative** and you **cannot** get any assistance from any person or computer application(google search, etc etc)

- A Chemist experimentally determined the boiling point of a substance to be 123.1 °C. The actual boiling point of the substance is 124.7 °C. Calculate the percent error.
 A) 1.3%; B) 0.0128 %; C) 13%; D) 77.9%
- Convert 160 °C to kelvins:
 A) 113 K; B) 160 K; C) 433 K; D) -113K
- A copper penny has a mass of 6.2 g and a volume of 0.70 cm³. What is the density of copper?
 A) 8.9 g/cm³; B) 0.11 g/cm³; C) 8.9 cm³/g; D) 0.11 cm³/g
- 4. How many neutrons are in the following atom-silver-108:A) 155; B) 216; C) 94; D) 61
- 5. _____ The following electron configuration represents which element- 1s²2s²2p⁶3s²3p⁴:
 A) Berrylium; B) sulfur; C) aluminum; D) argon
- 6. Calculate the wavelength of yellow light emitted by a sodium lamp if the frequency of the radiation is 5.50 x 10¹⁴ Hz.
 A) 5.45 x 10⁻⁷ m; B) 1.83 x 10⁻⁶ m; C) 1.83 x 10⁻⁷ m; D) 1.83 x 10⁻⁵ m
- As you move from left to right across a period in the Periodic table, the size of atoms:
 A) Stays the same; B) increases; C) decreases
- 8. What is the symbol for the ion which is formed when copper loses two electrons? A) Cu^{2-} ; B) Cu^{2+} ; C) ^{2+}Cu ; D) ^{2-}Cu
- 9. In the Lewis dot structure for a chlorine atom, how many dots would be placed around the symbol for chlorine:
 A) One; B) two; C) five; D) seven
- 10. _____ Which of the following is the correct formula for lithium nitride? A) LiN; B) LiNO₃; C) Li₃N; D) LiN₃
- 11. _____ What is the correct name for CBr₄ :
- A) Carbonate bromate; B) Tetracarbon bromide; C) Quatrocarbon bromide; D) Carbon tetrabromide

- 12. _____ How many moles of magnesium is 1.45 x 10²³ atoms of magnesium? A) 0.241 moles Mg; B) 0.028 mol Mg; C) 2.41 mol Mg; D) 0.28 mol Mg
- 13. _____ What is the molar mass of Ba(NO₃)₂ ? A) 261.3 g; B) 245.3 g; C) 229.3 g; D) 208.3 g
- 14. _____ Calculate the mass, in grams, of 3.50 mol of iron(II) hydroxide. A) 450.1 g ; B) 900.2 g ; C) 314.3 g ; D) 157.5 g
- 15. _____ Determine the volume, in liters, of 0.50 mol SO₂ gas at STP.
- A) 32 L; B) 128 L; C) 11.2 L; D) 44.8 L
- 16. _____ The density of a gaseous compound is found to be 1.564 g/L at STP. What is the molar mass of the compound?
 A) 35.0 g/mol; B) 14.3 g/mol; C) 14.3 g/L; D) 35.0 g/L
- 17. _____ Determine the percent composition of the following- Fe₂O₃ :
 A) 30.1 % O, 69.9% Fe; B) 74.2% Fe, 25.8% O; C) 69.9% Fe, 30.1 % O
- 18. _____ What is the empirical formula of the following compound which contains 40.0% C, 6.7% H, and 53.3% O ?
 A) CHO; B) C₂HO; C) CHO₂; D) CH₂O
- 19. _____ In the balanced equation for the reaction of aluminum sulfate and calcium hydroxide to form aluminum hydroxide and calcium sulfate, what is the coefficient of the calcium sulfate?
 A) One; B) two; C) three; D) four
- 20. _____ In the following single replacement reaction, what are the products: $Fe(s) + Pb(NO_3)_2(aq) \rightarrow ?$
 - A) No reaction; B) iron(II) nitrate and solid lead; C) iron(III) nitrate and solid lead
- 21. _____ When calcium bromide (aq) and silver nitrate(aq) react in a double replacement reaction, which of the following occurs?
 - A) No precipitate is formed; B) the precipitate is calcium nitrate; C) the precipitate is silver bromide; calcium nitrate and silver bromide are both precipitates
- 22. _____ A combustion reaction always involves which of the following as a reactant:
 A) Carbon dioxide; B) water vapor; C) oxygen; D) carbon dioxide and water vapor
- 23. When you write the balanced net ionic equation for the following reaction, what is the product-- Na₃PO₄(aq) + FeCl₃(aq) \rightarrow NaCl(aq) + FePO₄(s) A) Na⁺(aq) ; B) Na⁺(aq) + Cl⁻(aq); C) Fe³⁺ (aq) + PO₄³⁻(aq) ; D) FePO₄(s)
- 24. _____ Rust(Fe₂O₃) is produced when iron(Fe) reacts with oxygen(O₂): 4Fe(s) + $3O_2(g) \rightarrow 2Fe_2O_3(s)$ How many grams of Fe₂O₃ are produced when 12.0 g of iron rusts?
 - A) 6 grams; B) 12 grams; C) 17.2 grams; D) 24 grams

- 25. _____ What pressure, in kilopascals, does a gas exert at 485 mm Hg: A) 3657 kPa; B) 64.6 kPa; C) 49131 kPa; D) 0.133 kPa
- 26. _____ A gas at 175 kPa and 25°C has an initial volume of 1.50 L. The pressure of the gas increases to 611 kPa as the temperature is raised to 131°C. What is the new volume?
 A) 0.582 L; B) 2.25 L; C) 5.82 L; D) 0.225 L
- 27. _____ The solubility of a gas in water is 0.28 g/L at 108 kPa. What is the solubility when the pressure of the gas is increased to 298 kPa? Assume the temperature remains constant.
 A) 0.10 g/L ; B) 1.00 g/L ; C) 7.7 g/L; D) 0.77 g/L
- 28. _____ A solution has a volume of 350 mL and contains 0.60 mol NaCl. What is its molarity?
 A) 1.7 M ; B) 0.0017 M ; C) 0.58 M ; D) 583 M
- 29. _____ The temperature of a 95.4 gram piece of copper increases from 25°C to 48°C when the copper absorbs 849 J of heat. What is the specific heat of copper?
 A) 3.87 J/g°C ; B) 38.7 J/g°C ; C) 0.387 J/g°C ; D) 0.039 J/g°C
- How is the equilibrium position of this reaction affected by the following change: REMOVING HYDROGEN
 - $C(s) + H_2O(g) + heat \leftrightarrow CO(g) + H_2(g)$
 - A) Favors products; B) favors reactants; C) no effect
- 31. _____ The following reaction reaches equilibrium in a flask: $H_2(g) + CO_2(g) \leftrightarrow H_2O(g) + CO(g)$ Analysis of the mixture gives the following results: $H_2 = 0.053M$, $CO_2 = 0.053M$, $H_2O = 0.047M$, and CO = 0.047M. Calculate K_{eq} for the reaction. A) 0.79; B) 0.0079; C) 7.9; D) 79.0
- 32. ____ Find the pH of a solution where [H⁺] = 0.0015M A) 2.82; B) 2 ; C) 1.5 ; D) 4.5
- 33. _____ In the following reaction, identify the reducing agent $2Na(s) + S(s) \rightarrow Na_2S(s)$
 - A) Sulfur is the reducing agent; B) sodium is the reducing agent; C) sodium sulfide is the reducing agent
- 34. _____ Complete the following nuclear reaction equation

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- 35. _____ Manganese-56 is a beta emitter with a half-life of 2.60 hours. What is the mass of manganese-56 in a 2.00 mg sample at the end of 10.4 hours?
 - A) 0.063 mg; B) 6.3 mg; C) 63 mg; D) 0.125 mg