2nd Semester Chemistry-575 Final Exam Review
Answer Section

MULTIPLE CHOICE

1. ANS: B PTS: 1 DIF: L2 REF: p. 290 | p. 291
   OBJ: 10.1.2 Relate Avogadro's number to a mole of a substance.
2. ANS: B
   Mole ratio is 2 moles Al for 3 moles FeO. Therefore 1 mole Al would only need 1.5 moles of FeO. No need for mole island if you have nice whole numbers.

   PTS: 1 DIF: L1 REF: p. 359 | p. 360
   OBJ: 12.2.1 Construct mole ratios from balanced chemical equations and apply these ratios in mole-mole stoichiometric calculations. STA: 12.C.5.a
3. ANS: B
   -Emperical formulas are like a "reduced" formula in math; the lowest ratio of the elements.

   -The molecular formula is the actual number of atoms of each element in the molecule.

   -The molar mass should match the molecular formula.

   -90 g/mole is the mass of C3H12N3. C3H12N3 can be reduced to CH4N by dividing by 3.

   PTS: 1 DIF: L2 REF: p. 312
   OBJ: 10.3.3 Distinguish between empirical and molecular formulas.
4. ANS: A PTS: 1 DIF: L1 REF: p. 424
   OBJ: 14.2.2 Use the combined gas law to solve problems. STA: 12.C.5.b
5. ANS: C
   P1V1/T1 = P2V2/T2

   Don't forget to convert temperatures to Kelvins

   PTS: 1 DIF: L2 REF: p. 419
   OBJ: 14.2.2 Use the combined gas law to solve problems. STA: 12.C.5.b
6. ANS: C PTS: 1 DIF: L1 REF: p. 426
   OBJ: 14.3.1 Compute the value of an unknown variable in the equation for the ideal gas law.
   STA: 12.C.5.b
7. ANS: D
   PV=nRT

   Don't forget to convert temperatures to Kelvins

   PTS: 1
8. ANS: A PTS: 1 DIF: Medium OBJ: 2.3A
   TOP: Charles's Law SEC: A

9. ANS: A
Section : A

PTS: 1 DIF: Medium OBJ: 2.4A TOP: Temperature and Pressure
SEC: A

10. ANS: B PTS: 1 DIF: L1 REF: p. 386
OBJ: 13.1.2 Interpret gas pressure in terms of kinetic theory.
STA: 12.C.5.b

11. ANS: B
-High pressure pushes down on the surface of mercury in a thermometer making the mecury rise.

-Low pressure does not push on the surface of mercury in a thermometer so the level of mecury falls.

PTS: 1 DIF: L1 REF: p. 386
OBJ: 13.1.2 Interpret gas pressure in terms of kinetic theory.
STA: 12.C.5.b

12. ANS: A PTS: 1 DIF: Medium OBJ: 4.4B
TOP: Solubility Curves SEC: B

13. ANS: C
-Normally if you try to go above the solubility curve, the solution would be saturated and there would be undissolved solute on the bottom.

-In this question, they stipulate that all 80 grams dissolved. This would be a rare example of a solution that had become supersaturated.

-Supersatruated means that more is dissolved than should actually be dissolved at a given temperature.

PTS: 1 DIF: Medium OBJ: 4.4B TOP: Solubility Curves
SEC: B

14. ANS: A
polar dissolves polar

non-polar dissolves non-polar

ionic solids are very polar so will dissolve in polar substances like water

PTS: 1 DIF: Medium OBJ: 4.1B TOP: Polarity
SEC: B

15. ANS: D PTS: 1 DIF: L1 REF: p. 481
OBJ: 16.2.1 Solve problems involving the molarity of a solution.
STA: 12.C.5.b

16. ANS: B
You need to convert the grams of solute to moles.

Convert the volume of liquid from mL to Liters.

PTS: 1 DIF: L3 REF: p. 481
OBJ: 16.2.1 Solve problems involving the molarity of a solution.
STA: 12.C.5.b

17. ANS: A PTS: 1

18. ANS: D PTS: 1

19. ANS: A PTS: 1 DIF: L1 REF: p. 508
OBJ: 17.1.3 Identify the units used to measure heat transfer.
STA: 12.C.4.a

20. ANS: C

q=mc“t

rearrange the formula to solve for“t

“t = q/mc

solve for the change in temperature. Substances with low specific heats like lead heat up quickly. Substances with high specific heats like water need a lot of energy to increase their temperature.

PTS: 1 DIF: L1 REF: p. 509 | p. 510
OBJ: 17.1.3 Identify the units used to measure heat transfer.
STA: 12.C.4.a

21. ANS: A
Energy always moves into or out of a system during phase changes. Solids have the least energy, gasses have the most energy. If you want to move from a solid to liquid, and from a liquid to gas, you would need to add energy.

The opposite is also true. When you move from a gas to a liquid, and from a liquid to a solid, substances release energy to their surroundings.

PTS: 1 DIF: L2 REF: p. 512
OBJ: 17.2.1 Describe how calorimeters are used to measure heat flow.
STA: 12.C.4.a

22. ANS: A
Endothermic reactions must absorb energy so energy must be on the reactant side. Exothermic reactions would have energy on thr product side.

PTS: 1 DIF: L2 REF: p. 515
OBJ: 17.2.2 Construct thermochemical equations. | 17.2.3 Solve for enthalpy changes in chemical reactions by using heats of reaction. STA: 12.C.4.a

23. ANS: A
Phase changes occur during the flat spots.

PTS: 1 DIF: L2 REF: p. 515
OBJ: 17.2.2 Construct thermochemical equations. | 17.2.3 Solve for enthalpy changes in chemical reactions by using heats of reaction. STA: 12.C.4.a

24. ANS: B
A-B = solid
B-C = solid and liquid
C-D = liquid
D-E = liquid and gas
E-F = gas

PTS: 1 DIF: L2 REF: p. 515
OBJ: 17.2.2 Construct thermochemical equations. | 17.2.3 Solve for enthalpy changes in chemical reactions by using heats of reaction. STA: 12.C.4.a

25. ANS: B
A-B = KE changing
B-C = PE changing
C-D =KE changing
D-E = PE changing
E-F = KE changing

PTS: 1 DIF: L2 REF: p. 515
OBJ: 17.2.2 Construct thermochemical equations. | 17.2.3 Solve for enthalpy changes in chemical reactions by using heats of reaction. STA: 12.C.4.a

26. ANS: A
Endothermic reactions absorb energy. The products have more energy than the reactants. Remember this is an energy graph, not a temperature graph.

PTS: 1 DIF: L2 REF: p. 515
OBJ: 17.2.2 Construct thermochemical equations. | 17.2.3 Solve for enthalpy changes in chemical reactions by using heats of reaction. STA: 12.C.4.a

27. ANS: B
Endothermic reactions gain energy so the change in potential energy would be positive. Exothermic reactions drop in PE so would be reported as negative.

PTS: 1 DIF: L2 REF: p. 515
OBJ: 17.2.2 Construct thermochemical equations. | 17.2.3 Solve for enthalpy changes in chemical reactions by using heats of reaction. STA: 12.C.4.a

28. ANS: B
The energy needed to get “over the hump” is the activation energy.

PTS: 1 DIF: L2 REF: p. 515
OBJ: 17.2.2 Construct thermochemical equations. | 17.2.3 Solve for enthalpy changes in chemical reactions by using heats of reaction. STA: 12.C.4.a

29. ANS: B PTS: 1

30. ANS: B
pH + pOH = 14.
When the OH^- ions increase, the H^+ ions decrease.
When H+ ions increase, OH^- ions decrease.

Acids have a higher H^+
Bases have a lower H^+

Acids 0-7
Bases 7-14
Neutral 7

PTS: 1