Chemistry 151-01 Test #2 Name KEY

Winter, 2005 150 points

_____ 1) c) 120° (draw the lewis structure with C at center, double bonded to O and 2 H's connected to C. it's trigonal planar).

_____ 2) b) It has 16 valence electrons. (Draw Lewis structure: ::O=N=O::, totals 16 e's).

_____ 3) a) It does not follow the octet rule. (Draw Lewis structure: :::O-.N=O::, totals 17e's, N only has 7 e's around itself).

_____ 4) e) None of the above is true.

_____ 5) a) 3 … planar..

_____ 6) d) It has a triple bond.

_____ 7) c) Pyramidal.

_____ 8) d) 100 (MW = 40.1+12.0+3(16.0)=100.1)

_____ 9) a) 2.5 moles (MW = 40.1+12.0+3(16.0)=100.1; # mol = 250 g x(1 mol/100.1 g) = 2.5 moles)

_____ 10) e) 328 g (# mole $CaCO_3$ = 2.5 , so # mol of Xe = 2.5 also, so g Xe = 2.5 mol (131.3g/mol)=328.25)

_____ 11) d) 7.5 (# mole $CaCO_3$ = 2.5 , so # mol of O = 2.5 mol $CaCO_3$ (3 mol O/mol $CaCO_3$)=7.5)

_____ 12) d) 6 (balanced eqn is: $Al_2(SO_4)_3$ + 6 HCl --> 2 $AlCl_3$ + 3 H_2SO_4)

_____ 13) e) 24 (2 x (2x4) + 4 = 24)

_____ 14) a) 14 mol S (# mol S = 21 mol O_2 x (2 mol S/3 mol O_2) = 14 mol S)

_____ 15) e) 100 g (#g O = 100 g S (1molS/32.1gS)(1 mol O_2/1mol S)(32g O_2/mol O_2) = 100g O_2)

_____ 16) b) 4 L (# L H_2 = 10 L HF (3 L H_2/6 L HF) = 5 L H_2. Choose b ; it has the closest value to 5)

_____ 17) c) 1.5 x 10^{23} (# molecs H_2O = 4.5g H_2O (1 mol H_2O/18.0 g H_2O)(6.02 x 10^{23} molecs H_2O/mol H_2O)=1.5x10^{23})

_____ 18) b) atoms of H in 1 mole of H_2 (# atoms of H in 1 mole H_2 is 2 moles of H atoms = 2 x avogadro's number.)

_____ 19) c) the reaction results in a net release of heat.

_____ 20) d) lowers the activation energy.

_____ 21) b) 8.2 g
(#g$KClO_3$ = 3.2gO_2 (1mol O_2/32g O_2)(2 mol $KClO_3$/3 mol O_2)(122.6g $KClO_3$/mol $KClO_3$)=8.2 g $KClO_3$

_____ 22) b) Lowering the activation energy c) Lowering the pressure. d) Removing CO from the system. (note that due to a typo, there are all these correct answers to this number. It was not counted by the machine but was graded manually for all scantrons).

_____ 23) d) enthalpy

_____ 24) c) $E_{activation}$ = +30 kJ, (E_a = 120-15 = 70 kJ)

_____ 25) b) oxygen

_____ 26) a) the reducing agent

_____ 27) b) C

_____ 28) d) oxidizing

_____ 29) b) Sn^{2+} --> Sn^{4+}

_____ 30) d) all of the above

_____ 31) c) +6 2(+1)+x+4(-2)=0 so x = +6

_____ 32) e) both oxidized & reduced.

_____ 33) b) reduced

_____ 34) d) Oxidized forms of food are high in energy,

_____ 35) a) H_2

_____ 36) e) none of these.

_____ 37) d) a measure of the average kinetic energy of the molecules

_____ 38) c) 2250 ($P_1 = P_2V_2/V_1$, but $V_2/V_1 = 3$. so P_1 = (760)(3)=2280 (the closest to 2250))

_____ 39) a) if the pressure remains constant.

_____ 40) d) 22 mL ($V_2 = V_1\ T_2/T_1$ = (20mL)(273+57)/(273+27) = 20(330/300) = 20(1.1)=22 mL)

_____ 41) a) Boyle's

_____42) b) $T_2 = T_1\ (P_2V_2)/(P_1V_1)$

_____ 43) c) 2.6 g #g = 1.0L (1 mol/22.4L)(58g/mol)= 2.6 g

_____ 44) b) 155 (P_{O2}= .21(740Torr)=155.4 ≈ 155)

_____ 45) d) The path of moving gas molecules is slightly curved due to gravity.

_____ 46) a) 12.3L PV=nRT; V = nRT/p = (8.0g/32.0g/mol)(.0821atmL/molK)(27+273)/(380/760) =12.3 L

_____ 47) a) decreases with a decrease in pressure of the gas at the surface of the liquid.

_____ 48) e) none of the previous. (P_{O2}= .21(760Torr)=160). It's not too close to 155, so choose NOne of the previous since you have that choice.

_____ 49) b) leg muscle tissue

_____ 50) the air is saturated with water vapor.