CHM151 Quiz 2a 25 Pts Spring 2017 Name: Key

SHOW ALL WORK TO RECEIVE CREDIT

1. (4 Pts)Which two of the atoms below have the same number of neutrons? $^{28}_{14}Si$, $^{28}_{12}Mg$, $^{28}_{11}Na$, $^{25}_{12}Mg$?

2. (4 Pts)Which two of the ions below have the same number of electrons? $^{35}_{17}Cl^-$, $^{16}_{8}O^{2-}$, $^{70}_{31}Ga^{3+}$, $^{40}_{20}Ca^{2+}$

each have 18 e^-'s

3. (3 Pts) How many protons, neutrons, and electrons are in a carbon-13 atom?

Protons 6 neutrons 7 electrons 6

4. (5 Pts) The empirical formula of a hydrocarbon with a molar mass of 78.11 g/mol is CH. What is the molecular formula? (Atomic masses: C 12.01 H 1.01)

$\frac{78.11}{(12.01+1.01)} = 6$ C_6H_6

$78.11 \div 13.02 = 6$ so 6 × empirical formula

5 (4 Pts) What is the molar mass of nitroglycerine, $C_3H_5(ONO_2)_3$? (Atomic masses: C 12.01; H 1.01; O 16.00, N 14.01)

6 × 16.00
3 × 14.01
3 × 16.00
5 × 1.01
3 × 12.01
227.11

6. (5 Pts) How many moles of sodium chloride can be produced from the reaction of 3.35 moles of sodium with 2.13 moles of chlorine gas?

$2\ Na(s) + Cl_2(g) \rightarrow 2\ NaCl(s)$

3.35 moles 2.13 moles

Based on Na: $\frac{3.35\ mol\ Na}{2\ mol\ Na} \left| \frac{2\ moles\ NaCl}{} \right. = 3.35\ moles\ NaCl$

Based on Cl_2: $\frac{2.13\ mol\ Cl_2}{1\ mol\ Cl_2} \left| \frac{2\ moles\ NaCl}{} \right. = 4.26\ moles\ NaCl$

CHM151 Quiz 2B 25 Pts Spring 2017 Name: Key

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1. (4 Pts) Which two of the ions below have the same number of electrons? $^{35}_{17}Cl^-$ $^{16}_{8}O^{2-}$ $^{70}_{31}Ga^{3+}$ $^{40}_{20}Ca^{2+}$

2. (4 Pts) Which two of the atoms below have the same number of neutrons? $^{28}_{14}Si$ $^{28}_{12}Mg$ $^{28}_{11}Na$ $^{26}_{12}Mg$?

3. (3 Pts) How many protons, neutrons, and electrons are in a nitrogen-15 atom?

Protons 7 neutrons 8 electrons 7

4. (5 Pts) The empirical formula of a hydrocarbon with a molar mass of 78.11 g/mol is CH. What is the molecular formula? (Atomic masses: C 12.01 H 1.01)

C_6H_6

5 (4 Pts) What is the molar mass of nitroglycerine, $C_3H_5(ONO_2)_3$? (Atomic masses: C 12.01; H 1.01; O 16.00, N 14.01)

227.09

6. (5 Pts) How many moles of sodium chloride can be produced from the reaction of 4.35 moles of sodium with 3.13 moles of chlorine gas?

$2\ Na(s) + Cl_2(g) \rightarrow 2\ NaCl(s)$

4.35 moles 3.13 moles

Based on Na: $\frac{4.35\ \text{moles Na}}{2\ \text{moles Na}} \left| \frac{2\ \text{moles NaCl}}{} \right. = 4.35\ \text{mole NaCl}$

Based on Cl_2: $\frac{3.13\ \text{moles } Cl_2}{1\ \text{mole } Cl_2} \left| \frac{2\ \text{moles NaCl}}{} \right. = 6.26\ \text{moles NaCl}$