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Chapter 4 (397919)

About this Assignment

Description

Chemical Equations and Stoichiometry

Instructions

Chemical Equations and Stoichiometry

1. KT6 4.P.006. [489847] [Show Details](#)

Balance the following equations and name each reactant and product. (Use the lowest possible coefficients.)



products

SF₄H₂O

products

NO

H₂O

products

HF

H₃BO₃2. KT6 4.P.010. [489839] [Show Details](#)

The balanced equation for a reaction in the process of reducing iron ore to the metal is shown below.



(a) What is the maximum mass of iron, in grams, that can be obtained from 495 g of iron(III) oxide?

 g(b) What mass of CO is required to react with 308 g of Fe₂O₃? g3. KT6 4.P.026. [489881] [Show Details](#)Aspirin, C₈H₄(OCOCH₃)CO₂H, is produced by the reaction of salicylic acid, C₈H₄(OH)CO₂H, and acetic anhydride (CH₃CO)₂O.



If you mix **100.** g of each of the reactants, what is the maximum mass of aspirin that can be obtained?

g

4. KT6 4.P.031. [487438] [Show Details](#)

A mixture of CuSO_4 and $\text{CuSO}_4 \cdot 5 \text{H}_2\text{O}$ has a mass of **1.235** g, but after heating to drive off all the water, the mass is only **0.822** g. What is the mass percent of $\text{CuSO}_4 \cdot 5 \text{H}_2\text{O}$ in the mixture?

%

5. KT6 4.P.044. [489880] [Show Details](#)

To find the formula of a compound composed of iron and carbon monoxide, $\text{Fe}_x(\text{CO})_y$, the compound is burned in pure oxygen to give Fe_2O_3 and CO_2 . If you burn 1.959 g of $\text{Fe}_x(\text{CO})_y$ and obtain 0.789 g of Fe_2O_3 and 2.200 g of CO_2 , what is the empirical formula of $\text{Fe}_x(\text{CO})_y$? (Type your answer using the format CO_2 for CO_2 .)

6. KT6 4.P.045. [487803] [Show Details](#)

Balance the following equations. (Use the lowest possible coefficients.)

(a) the synthesis of urea, a common fertilizer



(b) reactions used to make uranium(VI) fluoride for the enrichment of natural uranium



(c) The reaction to make titanium(IV) chloride, which is then converted to titanium metal.



7. KT6 4.P.050. [489843] [Show Details](#)

Your body deals with excess nitrogen by excreting it in the form of urea, NH_2CONH_2 . The reaction producing it is the combination of arginine ($\text{C}_6\text{H}_{14}\text{N}_4\text{O}_2$) with water to give urea and ornithine ($\text{C}_5\text{H}_{12}\text{N}_2\text{O}_2$).



If you excrete **65** mg of urea, what quantity of arginine must have been used?

g

What mass of ornithine must have been produced?

g

8. KT6 4.P.068. [488058] [Show Details](#)

Thioridazine, $C_{21}H_{28}N_2S_2$, is a pharmaceutical used to regulate dopamine. (Dopamine, a neurotransmitter, affects brain processes that control movement, emotional response, and ability to experience pleasure and pain.) A chemist can analyze a sample of the pharmaceutical for the thioridazine content by decomposing it to convert the sulfur in the compound to sulfate ion. This is then "trapped" as water-insoluble barium sulfate (see Figure 4.8).



Figure 4.8

Suppose a 6 tablet sample of the drug yielded 0.397 g of $BaSO_4$. What is the thioridazine content, in milligrams, of each tablet?

40 ✓ mg

9. KT6 4.P.014. [486064] [Show Details](#)

The formation of water-insoluble silver chloride is useful in the analysis of chloride-containing substances. Consider the following unbalanced equation.



(a) Balance the equation. (Use the lowest possible coefficients.)



(b) What mass $AgNO_3$, in grams, is required for complete reaction with 0.142 g of $BaCl_2$?

40 ✓ g

What mass of $AgCl$ is produced?

40 ✓ g

10. KT6 4.P.036. [486059] [Show Details](#)

The aluminum in a 0.750 g sample of an unknown material was precipitated as aluminum hydroxide, $Al(OH)_3$, which was then converted to Al_2O_3 by heating strongly. If 0.154 g of Al_2O_3 is obtained from the 0.750 g sample, what is the mass percent of aluminum in the sample?

40 ✓ %

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