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## Limiting reagent worksheet pdf

Limit Reagents and Percent Yield Worksheet 1. Consider the reaction of  $I_2O_5(g) + 5 CO(g) \rightarrow 5 CO_2(g) + I_2(g)$  a) 80.0 grams iodine ( $I_2$ ) reacts with 28.0 grams of carbon monoxide, CO. Determine mass iodine  $I_2$ , which could be produced? b) If, in the above situation, only 0.160 moles, of iodine,  $I_2$  were produced. i) what mass of iodine was produced? ii) that yield rates of iodine were produced. 2. Zinc and sulphur react to the zinc form sulphide according to the equation.  $Zn + S \rightarrow ZnS$  If 25.0 g of zinc and 30.0 g of sulphur are mixed, a) Which chemical is the limited reactor? b) How many grams of NS will be formed? c) How many grams of the excess reactant will remain after the reaction ends? 3. What element is exceeded when 3.00 grams of Mg is ignored in 2.20 grams of pure oxygen? What is excess mes? What mass is MgO formed? 4. How many  $Al_2S_3$  grams are formed when 5.00 grams in Al is heated with 10.0 grams? 5. When  $MoO_3$  and Zn are heated together to react to  $3 Zn(s) + 2 MoO_3(s) \rightarrow Mo_2O_3(s) + 3 ZnO(s)$  Which mass of ZnO consists of 20.0 grams of  $MoO_3$  reacts with 10.0 grams of Zn? 6. Silver nitrate,  $AgNO_3$ , reacts with newly chlorik,  $FeCl_3$ , providing silver chlorist,  $AgCl$ , and newly nitrate, Iron ( $NO_3$ ). In a particular experiment, he planned to mix a solution with 25.0g of  $AgNO_3$  and another solution with 45.0 grams in  $FeCl_3$ . a) Write the chemical equation for the reaction. b) What are the reactive reactants limited to the reactant? c) What is the maximum number of  $AgCl$  moles that could be found in this mix? d) What is the maximum number of  $AgCl$  grams that could be found? e) How many grams of the reactant in excess will remain after the reaction ends? 7. Solid carbonate,  $CaCO_3$ , is able to remove dioxide sulphur from waste gases by the reaction:  $CaCO_3 + SO_2 + \text{other reagents} \rightarrow CaSO_3 + \text{other products}$  of a particular experience: 255 g of  $CaCO_3$  were exposed to 135 g of  $SO_2$  in the presence of an excess amount of other chemicals required for the reaction. a) What is the theoretical yield of  $CaSO_3$ ? b) If only 198 g of  $CaSO_3$  isolated from the products, what was the present yield of  $CaSO_3$  in this experience? 8. A research supervisor said a chemistry makes 100 g of chlorobenzene from the reaction of benzene and chlorinate and expects a yield by higher than 65%. What is the minimum number of benzene that can provide 100 g of chlorobenzene if the yield is 65%? The equation for the reaction is:  $C_6H_6 + Cl_2 \rightarrow C_6H_5Cl + HCl$  benzene chlorobenzene 9. Certain salt in benzoic aside are being used as food additives for decades. The salt potassium of benzoic acid, potassium benzoate, can be performed by the action of potassium permanent on toluene.  $C_7H_8 + 2 KMnO_4 \rightarrow KC_7H_5O_2 + 2 MnO_2 + KOH + H_2O$  toluen potassium benzoate If the yield of potassium benzoate cannot really be expected to be over 68%, which is the minimum number of grams toluen needed to achieve this yield while producing 10.0g of  $KC_7H_5O_2$ ? 10. Aluminum melts in an aqunt solution in NaOH according to this reaction:  $2 NaOH + 2 Al + 2 H_2O \rightarrow 2 NaAlO_2 + 3 H_2$  If 84.1 g of NaOH and 51.0 g in Al React: i) Which is the limited reactor? ii) How much of the other reaction remains? iii) What mass of hydrogen product? 11. Dimethylhydrazine,  $(CH_3)_2NNH_2$ , was used as a fuel for the Apollo Lunar Decent Module, and the  $N_2O_4$  was used as the oxidant. The products of the reaction are  $H_2O$ ,  $N_2$ , and  $CO_2$ . i) Write a balanced chemical equation for the combination reaction. ii) If 150 kg of  $(CH_3)_2NNH_2$  reacts with 460 kg of  $N_2O_4$ , what is the theoretical yield of  $N_2$ ? iii) If a yield of 30 kg of gas represents a 68% yield, which mass of  $N_2O_4$  would have been used up in the reaction? 12. Magnesium metal reacts quantitatively with oxygen to provide magnesium oxide, MgO. If 5.00 g of Mg and 5.00 g of  $O_2$  are allowed to react, what weight of MgO is formed, and what weight in which reactants react in excess? 13. Adoptic Acid,  $C_6H_{10}O_4$ , is a raw material for making nylon and it can be prepared in the lab by this reaction between siklohexene,  $C_6H_{10}$ , and sodium dichromate,  $Na_2Cr_2O_7$  in sulfuric acid.  $3 C_6H_{10}(l) + 4 Na_2Cr_2O_7(aq) + 16 H_2SO_4(aq) \rightarrow 3 C_6H_{10}O_4(aq) + 4 Cr_2(SO_4)_3(aq) + 4 Na_2SO_4(aq) + 16 H_2O$  Have Side Reaction. These losses further in products during its purification decrease the overall yield. A typical yield of purified adippic aside is 68.6%. (A) To prepare 12.5 grams of adoptic acid at 68.6% yield required for how many grams of siklohexene? (B) The only equipment available in dichromate sodium is its carbohydrate,  $Na_2Cr_2O_7 \cdot 2H_2O$ . (Since the reaction comes to an aqueous medium, the water in the carbohydrate causes no problem, but it contributes to the mass of what has taken off of that reactant). How many grams of this dioxide are also required in the preparation of 12.5grams of adipic acid at a yield of 68.6%? Answers

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