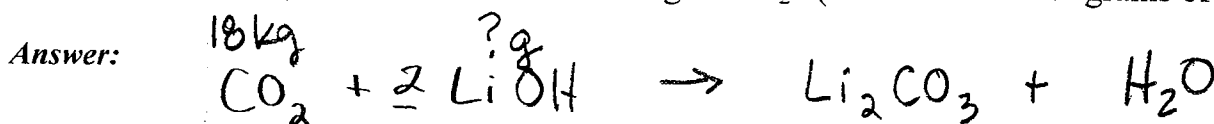


# STOICHIOMETRY - LECTURE NOTES

## Homework Answers (solutions to the homework) (the 3's) - Craig

### EXAMPLE #5:

One way to remove  $\text{CO}_2$  from air that must be recirculated (such as in a spacecraft cabin) is to react it with  $\text{LiOH}$  to form  $\text{Li}_2\text{CO}_3$  and water. How many grams of  $\text{LiOH}$  are needed for a 6.0 day, 3 person, mission - if in one day, a person exhales about 1.0 kg of  $\text{CO}_2$ ? (answer:  $2.0 \times 10^4$  grams of  $\text{LiOH}$ )



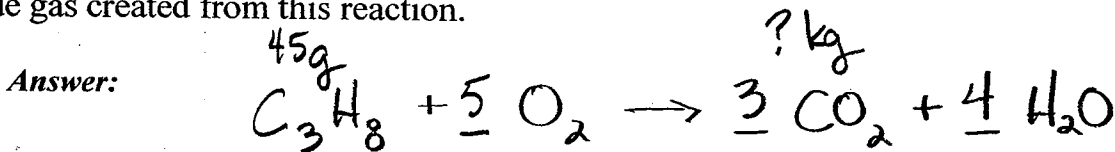
$$\frac{6 \text{ DAY} \mid 3 \text{ PEOPLE}}{\text{DAY}} \mid \frac{1.0 \text{ kg}}{1 \text{ PERSON}} = 18 \text{ kg } \text{CO}_2$$

$\text{LiOH}$ $19.6 \text{ g}$ ←
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$$\frac{18 \text{ kg } \text{CO}_2 \mid 1000 \text{ g} \mid 1 \text{ mol } \text{CO}_2 \mid 2 \text{ mol } \text{LiOH} \mid 6.94 \text{ g} + 16 \text{ g} + 1.00 \text{ g}}{1 \text{ kg} \mid 12.01 \text{ g} + 2(16 \text{ g}) \mid 1 \text{ mol } \text{CO}_2 \mid 1 \text{ mol } \text{LiOH}}$$

### EXAMPLE #6:

In combustion reaction where 45 grams of propane gas,  $\text{C}_3\text{H}_8$ , reacts with oxygen gas to produce the products of a combustion reaction (with a hydrocarbon). Calculate the mass (in kilograms) of carbon dioxide gas created from this reaction.



$$\frac{45 \text{ g } \text{C}_3\text{H}_8 \mid 1 \text{ mol } \text{C}_3\text{H}_8 \mid 3 \text{ mol } \text{CO}_2 \mid 12.01 \text{ g} + 2(16 \text{ g}) \mid 1 \text{ kg}}{3(12.01 \text{ g}) + 8(1.008 \text{ g}) \mid 1 \text{ mol } \text{C}_3\text{H}_8 \mid 1 \text{ mol } \text{CO}_2 \mid 1000 \text{ g}} =$$

$0.135 \text{ kg } \text{CO}_2$
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