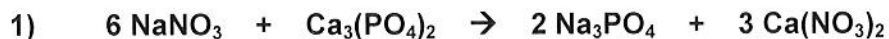


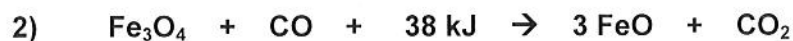
## The Mole Ratio and Energy of Reactions

Consider the chemical reaction represented by the balanced chemical equation below:



- a) How many moles are in 65 g of sodium nitrate?
  
  
  
  
  
  
  
  
  
  
- b) What is the mass of 3.7 moles of calcium phosphate?
  
  
  
  
  
  
  
  
  
  
- c) How many particles of sodium phosphate are in 100 g of sodium phosphate?
  
  
  
  
  
  
  
  
  
  
- d) How many atoms of oxygen are present in 50 g of calcium phosphate?
  
  
  
  
  
  
  
  
  
  
- e) How many moles of sodium phosphate will be produced if 12.9 moles of sodium nitrate react?
  
  
  
  
  
  
  
  
  
  
- f) What mass of calcium phosphate is required to react with 4.2 moles of sodium nitrate?
  
  
  
  
  
  
  
  
  
  
- g) How many molecules of calcium nitrate will be produced if 75 g of calcium phosphate react?
  
  
  
  
  
  
  
  
  
  
- h) What mass of sodium phosphate will be produced along with 150 g of calcium nitrate?

Chemical reactions can be exothermic (release of heat energy) or endothermic (absorb heat energy).



a) Is the reaction endothermic or exothermic and how do you know??

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b) How much energy is needed to produce 200 g of  $\text{CO}_2$ ?

c) If 50 g of  $\text{Fe}_3\text{O}_4$  are available for the reaction, how much energy will be needed?

d) If 100 kJ are available, how much FeO will be produced?



a) Is this reaction endothermic or exothermic and how do you know?

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b) What is the  $\Delta H$  for this reaction? \_\_\_\_\_

c) How much heat energy is involved if 35 g of ethylene are burned?

d) How many grams of oxygen would be required if  $4.5 \times 10^8$  J of energy are evolved?



a) Is this reaction endothermic or exothermic and how did you know from class?

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b) What is the  $\Delta H$  for this reaction? \_\_\_\_\_

c) How many grams of sodium would you have to react to produce  $5.5 \times 10^6$  kJ?