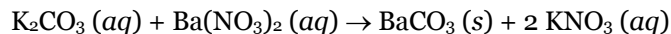


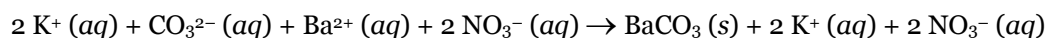
**Exercise 02**Name: \_\_\_\_\_ **Key**

Consider the balanced molecular reaction:

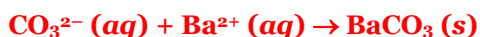


- (a) Write the balanced net ionic equation.  
(b) We mix 0.0375 mol  $\text{K}_2\text{CO}_3$  and 0.0350 mol  $\text{Ba}(\text{NO}_3)_2$ . What mass of solid  $\text{BaCO}_3$  can be made?
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- (a) We can start by writing the complete or total ionic equation, where we dissociate all *aqueous* species because they are soluble in water.



Now we can write the net ionic equation, where we eliminate all spectator ions (species that appear unchanged between the reactants and products side):  $\text{K}^+ (aq)$  and  $\text{NO}_3^- (aq)$ .



- (b) First, determine the limiting reactant. Because the mole ratio between  $\text{K}_2\text{CO}_3$  and  $\text{Ba}(\text{NO}_3)_2$  is 1:1, we know that the limiting reactant is  $\text{Ba}(\text{NO}_3)_2$ .

Now, determine the yield of  $\text{BaCO}_3$  from the limiting reactant:

$$0.0350 \text{ mol Ba}(\text{NO}_3)_2 \times \frac{1 \text{ mol BaCO}_3}{1 \text{ mol Ba}(\text{NO}_3)_2} \times \frac{137.31 \text{ g}}{1 \text{ mol BaCO}_3} = \mathbf{4.81 \text{ g BaCO}_3}$$