

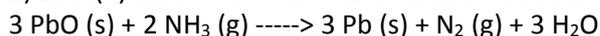
### 36604, Inorganic Chemistry

1. how many grams of Pb are formed when 0.105 g NH<sub>3</sub> react
2. If a reaction vessel contains 0.15 moles of LiOH and 0.08 moles CO<sub>2</sub> which compound is the limiting reagent
3. Lithium hydroxide absorbs carbon dioxide forming lithium carbonate and water



#### Solution:

1) Lead(II) oxide reacts with ammonia as follows:



The number of moles NH<sub>3</sub> in this reaction is:  $n = \frac{0.105}{17} = 0.006$  moles.

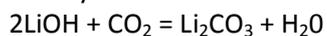
In accordance with the reaction, if 2 moles of NH<sub>3</sub> react 3 moles of Pb will be formed.

So, if react  $n = \frac{0.105}{17} = 0.006$  moles of NH<sub>3</sub>  $\frac{0.006 \cdot 3}{2} = 0.009$  moles of Pb will be formed.

Therefore, the mass of Pb is  $0.009 \cdot 207.2 = 1.865$  g.

**Answer: m(Pb) = 1.865 g**

2) Lithium hydroxide reacts with carbon dioxide as follows:



So, 2 moles of LiOH react with 1 mole of CO<sub>2</sub>, or 0.15 moles of LiOH react with

$\frac{0.15 \cdot 1}{2} = 0.075$  moles of CO<sub>2</sub>. Therefore, if a reaction vessel contains 0.15 moles of LiOH and 0.08

moles CO<sub>2</sub>, LiOH is the limiting reagent.

**Answer: LiOH is the limiting reagent.**