Stoichiometry – more practice!

1. 1.64 g of potassium chlorate was decomposed under intense heat. How many grams of each product were formed? Show the "CHECK" of your answer.
2. 6.0 L of ammonia gas reacts with oxygen gas to produce nitrogen dioxide gas and hydrogen gas. How many litres of all gases are present in this reaction? Why is there no such thing as a "Law of Conservation of Volume? If you really wanted to check your answer to this question, what could you do?
3. The combustion of benzene in oxygen produces 20.0 moles of carbon dioxide. How many moles of benzene ($C_6H_{6\,(g)}$) are needed?
4. When nitrogen gas combines with hydrogen gas, 5.63 g of ammonia is produced. How many litres of hydrogen gas reacted (at RTP)?
5. Calcium Phosphate reacts with Silicon Dioxide and Carbon (yes, this reaction has 3 reactants!) to form Calcium orthosilicite, carbon monoxide and 7.2 g of the third product. What was the third product? How many grams of Calcium Phosphate originally reacted?
6. Ammonia and oxygen react to produce water and nitrogen monoxide. What volume of each reactant gas is needed to produce 485 g of water at RTP?
7. 681 L of ethane ($C_2H_{6\,(g)}$) burns completely in air at STP. Determine the mass of all participants in this reaction.
8. What masses of zinc and hydrochloric acid must be reacted to generate 156 L of Hydrogen gas at RTP? Show your check of the Law of Conservation of Mass.

ANSWERS

1. 1.00 g of KCl and 0.643 g of O_2
2. 6.0 L of NH_3, 6.0 L O_2, 6.0 L of NO_2 and 9.0 L of H_2
3. 3.33 moles of $C_6H_{6\,(g)}$
4. 12.2 L
5. The third product was P_4. 37 g of Calcium Phosphate originally reacted.
6. 439 L of NH_3, and 549 L of O_2
7. Qn gives only 3 SF. Therefore:
   914 g of C_2H_6, 3410 g of O_2, 2680 g of CO_2, 1650 g of $H_2O_{(g)}$
8. 417 g of Zn and 464 g of HCl.

If your answers differ slightly from these, it is because the final answer depends totally on WHEN you round off in the question...whether you are retaining all decimal places until the end, or only using the required sig figs during the calculations.