HW 20

Hydrogen

1. Hydrogen in the lab is often obtained with the following reaction:

   $Zn + 2HCl = H_2 + ZnCl_2$
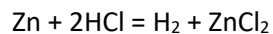
Calculate how many grams of zinc is needed to obtain 1.12 L of hydrogen under normal conditions. (Firstly, calculate how many moles of hydrogen are in 1.12 L under normal conditions (One mole of each gas has a volume of 22.4 L). Then, using the balanced reaction above, calculate the mass of zinc needed to form these number of moles of hydrogen.)

2. 23 g of Na reacted with 1018 ml of water.
   a. How many grams of NaOH are dissolved in 1L of the solution?
   b. How many liters of hydrogen did form?

   $2Na + 2H_2O = H_2 + 2NaOH$
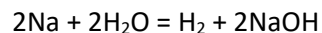
(Firstly, figure out how many grams of water reacted with 23 grams of Na to form NaOH (assume 1g/ml water density). The remaining (non-reacted water) will form the solution of NaOH. The calculations of NaOH mass and the volume of hydrogen are straight forward using the above equation and the fact that the volume of 1 mole of each gas is 22.4L under normal conditions.)