$$2\ H_2O_2(aq) \rightarrow 2\ H_2O(l) + O_2(g)$$

3. The mass of an aqueous solution of H_2O_2 is 6.951 g. The H_2O_2 in the solution decomposes completely according to the reaction represented above. The $O_2(g)$ produced is collected in an inverted graduated tube over water at 23.4°C and has a volume of 182.4 mL when the water levels inside and outside of the tube are the same. The atmospheric pressure in the lab is 762.6 torr, and the equilibrium vapor pressure of water at 23.4°C is 21.6 torr.

   (a) Calculate the partial pressure, in torr, of $O_2(g)$ in the gas-collection tube.

   (b) Calculate the number of moles of $O_2(g)$ produced in the reaction.

   (c) Calculate the mass, in grams, of H_2O_2 that decomposed.

   (d) Calculate the percent of H_2O_2, by mass, in the original 6.951 g aqueous sample.

   (e) Write the oxidation number of the oxygen atoms in H_2O_2 and the oxidation number of the oxygen atoms in O_2 in the appropriate cells in the table below.

Substance	Oxidation Number of Oxygen Atoms
H_2O_2	
O_2	

   (f) Write the balanced oxidation half-reaction for the reaction.

S T O P

If you finish before time is called, you may check your work on this part only.
Do not turn to the other part of the test until you are told to do so.

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