Answer EITHER Question 2 below OR Question 3 printed on page 8. Only one of these two questions will be graded. If you start both questions, be sure to cross out the question you do not want graded. The Section II score weighting for the question you choose is 20 percent.

2. A rigid 8.20 L flask contains a mixture of 2.50 moles of H_2, 0.500 mole of O_2, and sufficient Ar so that the partial pressure of Ar in the flask is 2.00 atm. The temperature is 127ºC.

   (a) Calculate the total pressure in the flask.

   (b) Calculate the mole fraction of H_2 in the flask.

   (c) Calculate the density (in g L^{-1}) of the mixture in the flask.

   The mixture in the flask is ignited by a spark, and the reaction represented below occurs until one of the reactants is entirely consumed.

$$2\ H_2(g)\ +\ O_2(g)\ \rightarrow\ 2H_2O(g)$$

   (d) Give the mole fraction of all species present in the flask at the end of the reaction.