Chemistry 135 Semester 01-2012
Homework for Submission #2

Answer the following questions and submit them for marking on or before 5 pm Thursday 23rd February in the chemistry drop box. Proper setting out is crucial, and only answers showing full working can attract full marks. Express your answers to the correct number of significant figures. Answers showing evidence of copying will attract zero marks. Students are requested to print out this page on letter-sized paper, work out their answers in rough, and submit their answers on it. Sheets must be carefully stapled and marked with full name, lecturer's name, and student number.

1) At a temperature of 25°C and a pressure of 750 Torr, 1.00 g of cyanogen gas occupies 0.476 L. Determine the molar mass of cyanogen. Given that the empirical formula is CN, determine the molecular formula.

2) A gas is enclosed in a cylinder with a gas-tight plunger. *Explain* carefully, with reference to molecules, the effect of pushing the plunger in on:
   a) the density of the gas.

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   b) the pressure of the gas.

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3) Calculate the pressure in atmospheres of a 1.000 mol of chlorine gas enclosed in a 1.000 dm^3 vessel at 25°C assuming:

   a) it behaves ideally. (Use R = 0.08206 dm^3 atm mol^{-1} K^{-1}).

   b) it behaves according to the Van der Waals equation.

   c) Comment on the difference between the values.