DEPARTMENT OF CHEMISTRY & LIFE SCIENCE

CH365 2024-2025                                    TEXT: Smith, Van Ness, Abbott & Swihart
Beer Day Bonus                                     SCOPE: Lessons 10-15
27 September 2024                                   TIME: 60 minutes

References Permitted: Open notes, book, internet, CHEMCAD, Mathematica, Excel.

## INSTRUCTIONS

1. This is a BONUS exercise and is due **Friday 1630 27 September 2024**.
2. There are 2 problems on 1 page in this exercise (not including the cover page).
3. Save all electronic work to your SharePoint Directory.
4. Write down the file name and file location.


(TOTAL WEIGHT: 30 POINTS)

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DO NOT WRITE IN THIS SPACE

| PROBLEM | VALUE | CUT |
|---------|-------|-----|
| A | 20 | |
| B | 10 | |
| TOTAL BONUS | 30 | |

Problem:  Weight:

  A      20

Table I in the attached paper contains experimentally measured pressures of xenon gas as a function of temperature and molar density. Calculated values of pressure are indirectly shown in the same table as deviations from the measurements. The calculations were performed with the Beattie-Bridgeman equation of state, which is presented in Table II in the paper along with the constants used in the equation.

The assignment is to repeat the calculations in the table using the Beattie-Bridgeman equation. A spreadsheet accompanies this handout with the experimental values typed in, in the same format at Table I. Complete the green-shaded cells in the spreadsheet.

Problem:  Weight:

  B      10

Calculate the average deviation, average percent deviation, total average deviation, and total average percent deviation for your results. Complete the yellow-shaded cells in the accompanying spreadsheet.

Additional Bonus:

An additional 10 bonus points will be awarded to those cadets who successfully use Mathematica Link for Excel to complete the green "calc" cells in the spreadsheet. That is, the total weight of the assignment would be 40 points instead of 30.

There are sufficient resources available in CANVAS to help you do this. The Mathematica Link for Excel (MLE) setup file can be found in CANVAS Resources, and there are two videos explaining how to use MLE in the CANVAS Assignment. You should study both videos before attempting this part of the assignment.

The entire 40 points will be awarded for completing the assignment in Mathematica with MLE. That is, you do not need to do both an Excel and a Mathematica solution.

For example, a cadet who completes both problems A and B in Excel without Mathematica will receive 30 points. A cadet who completes problem A in Mathematica with MLE and who also complete problem B in Excel will receive 40 points.