Quiz 1.2 – Real Gases

Name: _____

Question 1

Using Table 1C.3 (van der Waals coefficients) at the end of your textbook, find the following (From those listed in the table):

- Smallest gas particle
- Largest gas particle
- Gas with the strongest attractive forces
- Gas with the weakest attractive forces

Question 2

Ammonia has van der Waals constants of $a = 4.169 \frac{L^2 bar}{mol^2}$ and $b = 0.0371 \frac{L}{mol}$

$8.00\ mol$ of ammonia are placed in $2.75\ L$ at $348\ K$. Find the following:

- Pressure (bar) assuming ideal behavior
- Pressure (bar) using the van der Waals equation
- Compression factor (Z) using this van der Waals pressure
- Reduced state variables, V_r, p_r, and T_r (You will need to refer to your textbook)

Question 3

Explain the significance of the Boyle temperature of a gas as it relates to:

- The virial equation –

- The ideal gas law –

Question 4

Ammonia has second virial coefficient of $B = -165\frac{cm^3}{mol}$ at $348\ K$

$8.00\ mol$ of ammonia are placed in $2.75\ L$ at $348\ K$

- Find the pressure (bar) using the virial equation

- Find the compression factor (Z) using this virial pressure

- Compare the van der Waals pressure calculated above to this virial pressure

- Explain how the results of the virial equation can rival those of the van der Waals equation, when it uses only one corrective term and the van der Waals equation uses two

The Waves

By Virginia Woolf

I see nothing.

We may sink and settle
on the waves.
The sea will drum
in my ears.

The white petals
will be darkened
with sea water.

They will float
for a moment
and then sink.

Rolling over
the waves will
shoulder me under.

Everything falls in a
tremendous shower,
dissolving me.