

Department of technology

Grade: fourth year

Specialty: chemical engineering

Module: English

Text

An ideal gas is one that follows the gas laws at all conditions of temperature and pressure. To do so, the gas would need to completely abide by the kinetic-molecular theory. The gas particles would need to occupy zero volume and they would need to exhibit no attractive forces whatsoever toward each other. Since neither of those conditions can be true, there is no such thing as an ideal gas. A real gas is a gas that does not behave according to the assumptions of the kinetic-molecular theory. Fortunately, at the conditions of temperature and pressure that are normally encountered in a laboratory, real gases tend to behave very much like ideal gases.

Under what conditions then, do gases behave least ideally? When a gas is put under high pressure, its molecules are forced closer together as the empty space between the particles is diminished. A decrease in the empty space means that the assumption that the volume of the particles themselves is negligible is less valid. When a gas is cooled, the decrease in kinetic energy of the particles causes them to slow down. If the particles are moving at slower speeds, the attractive forces between them are more prominent. Another way to view it is that continued cooling the gas will eventually turn it into a liquid and a liquid is certainly not an ideal gas anymore. In summary, a real gas deviates most from an ideal gas at low temperatures and high pressures. Gases are most ideal at high temperature and low pressure.

Questions:

Part one:

1/ say whether the following sentences are true or false: (4pts)

- a/ an ideal gas is the one that pursues the gas laws each one of conditions of temperature and pressure.
- b/ the empty space between the particles is reduced when putting a gas into an altitude pressure.
- c/ when a gas gets cold, the reduction in kinetic energy of the particles causes them to ease up.
- d/ real gases swerve most from ideal gases when it comes to low temperature and high pressures.

2/ answer the following questions from the text: (3pts)

- a/ what is the difference between a real gas and an ideal gas?
- b/ is there any intermolecular attractive forces of atoms or molecules for an ideal gas?
- c/ do real gases adhere the ideal gas law?

3/ find in the text words that are close in meaning to: (1pt)

- a/ swerves=
- b/ reduce=

4/ find in the text words that are opposite in meaning to: (1pt)

- a/ Farther=
- b/ primarily=

part two:

1/ match the following tools with their proper use: (2pts)

- | | |
|--------------------|---|
| a/ measuring flask | 1/ is used for holding chemicals during heating to very high temperatures. |
| b/ filter funnel | 2/ is used to separate solid/ liquid mixture. |
| c/ bunsen burner | 3/ is used for dilutions and preparation of standard solutions |
| d/ crucible | 4/ is frequently used as a heat source in the absence of flammable materials. |

2/ translate the following chemical instruments in English: (2pts)

- | | | | |
|-----------------|------------------------|----------------------|-------------------------------|
| جهاز المطياف /4 | جهاز الامتصاص الذري /3 | جهاز مطياف الكتلة /2 | جهاز الفحص بالأشعة السينية /1 |
|-----------------|------------------------|----------------------|-------------------------------|

3/ write the full word for the following abbreviations: (2.5pts)

the ideal gas equation:

$$PV=nRT$$

P stands for→ V stands for→ N stands for→ R stands for→ T stands for→

4/ fill in the blanks with the right word: (4.5pts) (choose one of these fill in the blanks or the paragraph)

Organic- elements- compounds- composition- carbon

..... chemistry is the study of the structure, properties, ..., reactions and preparation(of carbon-containing compounds. Most organic contain carbon and hydrogen, but they may also include any number of other (e.g., nitrogen, oxygen, halogens, phosphorus, silicon, sulfur).

Transfer- flows- heat- break- phase- liquid

..... causes a difference in temperature when heat from one body to another. Heat can also cause a change in the state of matter. For example, heating H₂O(s) (ice) would cause the molecules to move at a faster rate. The increase in rate would intermolecular forces and cause the solid to change into a liquid, where the intermolecular forces aren't as strong and constricting as those in a solid.

5/ based on your background knowledge write a well organized paragraph talking about the four main categories of hydrocarbon (alkanes/ alkynes/ alkenes/ alcohol) (what are they and their general formula). (4.5pts)

Best of luck

Correction of the first English exam

(4 year students chemical/ process engineering)

Part one:

1/ true or false (4pts)

a/ true

b/ true

c/true

d/ true

2/ answering the questions from the text (3pts)

a/ real gas is a gas that does not behave according to the assumptions of the kinetic-molecular theory./ ideal gas is one that follows the gas laws at all conditions of temperature and pressure.

b/ no; there are not.

c/ no, they don't.

3/ synonyms/ opposites (2pts)

Swerves= deviates

reduce= decrease

Farther=/= closer

primarily=/= eventually

Part two:

1/ matching tools with their uses (2pts)

a→3

b→2

c→4

d→1

2/ translation of words (2pts)

1/ x-ray machine→جهاز الفحص بالأشعة السينية

2/ the mass spectrometer→جهاز مطياف الكتلة

3/ atomic absorption device→جهاز الامتصاص الذري

4/ spectroscopy device→جهاز المطياف

3/ giving the full word from the following equation (abbreviations) (2.5pts)

$$PV=nRT$$

P→ pressure

V→ volume

N→ number of moles of gas

R→ gas constant

T→ temperature

4/ fill in the blanks (4.5pts)

First paragraph: organic- composition- compounds- elements

Second paragraph: heat- flows- transfer- break- phase.

5/ the paragraph (4.5pts)

A paragraph talking about (alkenes- alkanes- alkynes- alcohol) / (their definition and their general formula)