

طابق

Department of technology

Level: fourth year students (chemical/ process engineering)

full name:.....

Module: English

Text

Matter can exist in three states, solid, liquid and gas. These states of matter can be differentiated on the basis of position or motion of their constituent particles. In solid-state, particles cannot move from their position. They can only vibrate at their mean position. On the contrary, in gaseous state particles can move randomly due to their high kinetic energy. They do not have a fixed position but show random movement. Liquid state can be considered as an intermediate state of matter in which particles can be moved and do not have a fixed position but their kinetic energy is less than gaseous particles and more than solid particles. They acquire the shape of the container in which they are.

Molecules are always in motion. In solids and liquids, they are packed tightly together. In a solid, the motion of the molecules can be likened to rapid vibration. In a liquid, the molecules can move freely among each other, in a sort of slithering fashion. In a gas, the density of molecules is generally less than in a liquid or solid of the same chemical compound, and they move even more freely than in a liquid. For a specific compound in a given state (solid, liquid, or gas), the speed of molecular motion increases as the absolute temperature increases.

adopted and adapted

Questions

Part one:

1/ say whether the following statements are true or false (3pts)

a/ neither solid nor liquid can be squashed.....

b/ in liquids the forces between particles are lower comparing to solids.....

c/ in gaseous state particles can move randomly owing to the fact that their high kinetic energy.....

2/ answer the following questions (2pts)

a/ can particles in the gaseous state squash?

.....

b/ which states do require to fill the shape of their containers?

.....

3/ find in the text words that are close/opposite in meaning to the following words (2pts)

pace=.....

resembled=.....

regular=/=

rigid=/=.....

Part two:

1/ fill in the gaps with the right word(4pts)

space- motion- molecules- interactions- particles- speed

The random of molecules in the gaseous state is due to high kinetic energy in They have weak intermolecular between them. The intermolecular between gaseous molecules is very large. They can show all the three types of molecular motion, vibrational, rotational and translational motion.

2/ define the following terms (3pts)

a/ condensation:

.....

b/ melting:

.....

c / freezing point:

.....

3/ translate the following words into English/ Arabic (6pts)

1/ texture.....

2/ solubility.....

3/ الحركة بين الجزيئات.....

4/ نقطة الغليان.....

Correction of the second exam

(4 year chemical engineering)

Part one

1/ true / false (3pts)

a/false

b/true

c/ true

2/ answering the questions (2pts)

a/yes, they can

b/ liquids and ~~solid~~ *gases*

3/ synonyms/ opposite (2pts)

Pace= speed

resembles= likened

Regular=/= random

rigid ~~= solid~~ *liquid*

Part two:

1/ fill in the gaps (4pts)

Motion- molecules- interactions- space

2/ definition of words (3pts)

a/condensation: to go from gaseous state into liquid state

b/melting: the change of state from a solid into a liquid

c/ freezing point: the temperature required for a liquid to change to a solid

3/ translation of words (6pts)

1/ texture → الملمس

2/ solubility → *الذوبان*

→ الحركة بين الجزيئات intermolecular motion

→ نقطة الغليان the boiling point

5/ fluids → السوائل

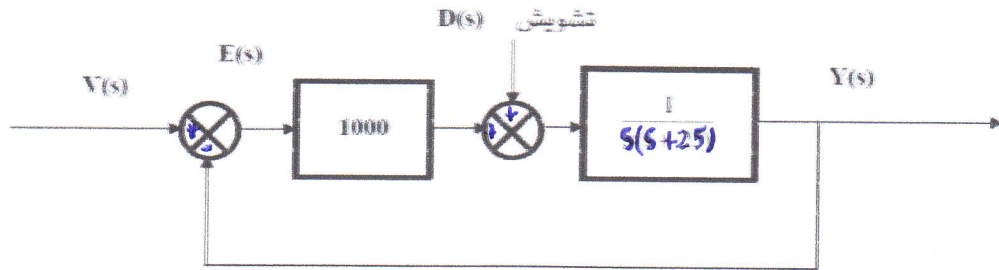
→ نقطة التجمد the freezing point



الأسئلة:

تمرين 1 : (4نقاط)

أوجد الخطأ الاستاتي للمنظومة المبينة في الصورة الآتية ، عندما تسلك عليها تشويش في شكل وحدة درجية.



حيث : $G_1(s) = 1000$ و $G_2(s) = \frac{1}{s(s+25)}$.

تمرين 2 : (8نقاط)

أوجد قيم ζ للمنظومات التالية والمثلة في الدوال التحويلية الآتية :

$$G(s) = \frac{12}{s^2 + 8s + 12}$$

$$G(s) = \frac{16}{s^2 + 8s + 16}$$

$$G(s) = \frac{20}{s^2 + 8s + 20}$$

تمرين 3 : (8نقاط)

1.

نظام تحكم آلي يمكن تمثيله بالمعادلة التفاضلية التالية :

$$\frac{dy(t)}{dt} + 10y(t) = 50 \quad \text{حيث } t \geq 0$$

أوجد :

- ثابت الزمن τ
- كسب النظام
- الاستجابة الزمنية مع رسم منحنى الاستجابة

2.

نظام تحكم آلي يمكن تمثيله بالمعادلة التفاضلية التالية :

$$\frac{d^2 y(t)}{dt^2} + 3 \frac{dy(t)}{dt} + 2y(t) = 2 \quad \text{حيث } t \geq 0$$

أوجد :

- تردد الرنين ومعامل الإخماد ونوع الإخماد
- كسب النظام G
- الاستجابة لوحد درجية مع رسم منحنائها.

بالتوفيق أستاذ المادة

المسألة - 1 -

من الرسم المرفوق لدينا

$$Y(s) = V(s) - E(s)$$

$$Y(s) = E(s) G_1(s) G_2(s) + D(s) G_2(s)$$

$$E(s) = \frac{1}{1 + G_1(s) G_2(s)} \left[V(s) - \frac{G_2(s)}{1 + G_1(s) G_2(s)} D(s) \right]$$

حيث $E(s)$ دالة الخطأ،

الخطأ الثاني :

$$e(\infty) = \lim_{s \rightarrow 0} s E(s) = \lim_{s \rightarrow 0} \frac{s}{1 + G_1(s) G_2(s)} V(s) - \lim_{s \rightarrow 0} \frac{s G_2(s)}{1 + G_1(s) G_2(s)} D(s)$$

$$= e_v(\infty) - e_D(\infty)$$

$$\frac{1}{s} = D(s) \quad \text{بما أن :}$$

$$e_D(\infty) = - \frac{1}{\lim_{s \rightarrow 0} \frac{1}{G_1(s)} + \lim_{s \rightarrow 0} G_1(s)} = - \frac{1}{0 + 1000}$$

$$e_D(\infty) = - \frac{1}{1000}$$

$$e_s(\infty) = \frac{1}{1000} \quad \frac{1}{s} = V_e(\infty) \quad \text{##}$$

$$\frac{e_v(s)}{V(s)} = \frac{s}{s(1 + G_1(s)G_2(s))}$$

$$= \frac{1}{1 + G_1(s)G_2(s)}$$

$$= \frac{1}{1 + \frac{1}{s(s+25)} \cdot 1000}$$

$$= \frac{s(s+25)}{(s(s+25) + 1) \cdot 1000} = 0$$

$$e(\infty) = -\frac{1}{1000} = 0,001$$

التصنيف 12 الشكل العام:

$$G(s) = \frac{\omega_n^2}{s^2 + 2\zeta\omega_n s + \omega_n^2} \quad (2)$$

و من:

$\zeta_1 = 1,155 \leq G_1(s) \quad (2)$

$\zeta_2 = 1 \leq G_2(s) \quad (2)$

$\zeta_3 = 0,894 \leq G_3(s) \quad (2)$

التصنيف 13

1.

$\begin{cases} \zeta = 0,1 \\ G = 5 \end{cases}$

$y(t) = 5 - 5e^{-\omega_n t}$



$\zeta = 0,6$

$\omega_n = 1,414$

$G = 1$

$y(t) = 1 + e^{-2t} - e^{-t}$

الانحدار زائد



الرسم