TOSHKENT KIMYO-TEXNOLOGIYA INSTITUTI

SHAHRISABZ FILIALI

FIZIKA

Fanidan amaliy mashg’ulot

Gazning bajargan ishi. Issiqlik sig’imi.

Shahrisabz-2020

Bahromova Anzura

1. 11. 18. Massasi m = 4 g bo’lgan vodorod o’zgarmas bosim ostida ΔT= 10 K ga qizdirilgan. Gaz kengayishining ishi A aniqlansin.

Berilgan

m = 4 g = $4 \cdot 10^{-3}$ kg

ΔT= 10 K

M=$2 \cdot 10^{-3}$ kg/mol

R= 8,31J/mol ·K

A-?

Yechilishi

$A = \frac{m}{M} R \Delta T$

$A = \frac{4 \cdot 10^{-3}}{2 \cdot 10^{-3}} \cdot 8{,}31 \cdot 10 = 166$ J

2. 11. 19. V_1 = 12 l hajmni egallagan P_1 = 100 k Pa bosim ostida gaz T_1 = 300 K haroratdan to T_2 = 400 K haroratgacha izobarik ravishda qizdiriladi. Gaz kengayishining ishi A aniqlansin.

Berilgan

$V_1 = 12\ l = 12 \cdot 10^{-3}\ m^3$

$P_1 = 100\ kPa = 10^5 Pa$

$T_1 = 300\ K$

$T_2 = 400\ K$

A-?

Yechilishi

$A = P(V_2 - V_1)$; P = const

$\frac{V_1}{T_1} = \frac{V_2}{T_2}$; $V_2 = \frac{V_1 T_2}{T_1}$

$A = P(\frac{V_1 T_2}{T_1} - V_1)$; $A = P V_1(\frac{T_2}{T_1} - 1)$

$A = 10^5 \cdot 12 \cdot 10^{-3}(\frac{400}{300} - 1) = 400\ J$

3. V. 5.162. 2 k mol karbonad angidrid gazi o’zgarmas bosimda 50^0 C ga isitilgan 1) gaz ichki energiyasining o’zgarishi, 2) kengayganda bajarilgan ish 3) gazga berilgan issiqlik miqdori topilsin.

Berilgan

$\upsilon = 2$ kmol $= 2\cdot10^3$ mol

$P = const$

$\Delta T = 50$ K

$i = 6$

$R = 8{,}31 J/mol\cdot K$

ΔU-?

A-?

Q-?

Yechilishi

$\Delta U = \frac{i}{2}\upsilon R \Delta T$ (1)

$\Delta U = 3\upsilon R \Delta T$ (2)

$A = P\Delta V = \upsilon R \Delta T$ (3)

$Q = \Delta U + A$ (4)

$\Delta U = 3\cdot2\cdot10^3 \cdot 8{,}31\cdot50 = 2490\cdot10^3 J = 24{,}9\cdot10^5 J$

$A = 2\cdot10^3\cdot8{,}31\cdot50 = 8{,}31\cdot10^5 J$

$Q = (24{,}9+8{,}31)\cdot10^5 = 33{,}2\cdot10^5 J$

Topshiriq

1. Massasi m = **n** g bo’lgan vodorod o’zgarmas bosim ostida ΔT= 10 K ga qizdirilgan. Gaz kengayishining ishi A aniqlansin.

2. Ikki atomli gaz izobarik ravishda kengayganda **n** J ish bajarilgan. Gazga qancha issiqlik miqdori berilgan.

3. Agar m = **n** g massali vodorod T = 290 K haroratda izotermik ravishda kengayganda uning hajmi uch marta oshgan bo’lsa, bunda qanday A ish bajarilgan.

Izoh**:** **n** sonining o’rniga har bir talaba o’zining jurnaldagi nomerini masalaga qo’yib ishlaydi.