

Answer on Question #52089, Physics, Field Theory

An ideal gas undergoes a cycle of processes as shown in the p-V diagram gases . Which statement correctly describes the situation? Click here to see exhibit

The internal energy of the gas increases over one complete cycle.

Over the entire cycle, work is done by the gas.

The gas absorbs more heat than it releases heat over the whole cycle

The gas gives out more heat than it absorbs over the whole cycle.

Answer: The gas absorbs more heat than it releases heat over the whole cycle

2 A fixed mass of an ideal gas slowly releases 1500 J of heat and as a result contracts slowly, at a constant pressure of 2.0×10^4 Pa, from a volume of 0.050 m^3 to 0.025 m^3 . What is the effect on the internal energy of the gas?

It decreases by 2000 J.

It decreases by 1000 J.

It is unchanged.

It increases by 1000 J.

Solution

$$Q = 1500 \text{ J} + \Delta V \cdot p = 1500 \text{ J} + (0.025 \text{ m}^3 - 0.050 \text{ m}^3) \cdot 2 \cdot 10^4 \text{ Pa} = 1000 \text{ J}$$

where ΔV is the volume change; p is the pressure

Answer: It increases by 1000 J.