Answer on Question #52084, Physics, Field Theory

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 x 104 Pa, from a volume of 0.050 m3 to 0.025 m3 . 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

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

where ΔV is the volume change; p is the pressure

Answer: It increases by 1000 J.

3 A dam is thicker at the bottom than at the top because surface tension exists only on the surface of liquids.

it looks better

water is denser at deeper levels.

water pressure is greater with increasing depth.

Answer: water pressure is greater with increasing depth.

4 A completely submerged object always displaces its own

density of fluid.

weight of fluid.

volume of fluid.

all of these

Answer: volume of fluid.

5 When gas in a container is squeezed to half its volume, its density

quadruples.

halves.

doubles.

remains the same.

Answer: doubles.