

Topic: For air  $\gamma = 1.41$ , then substituting the name of  $\gamma$  in above equation, we get the value of  $V = 332 \text{ ms}^{-1}$ . This results good agrees with experimental value.

① Effect of density of medium on velocity of sound ( $V$ ) - The velocity of sound in a air/gas is inversely proportional to the square root of its density.

② Effect of temperature on ( $V$ ): - The velocity of sound is directly proportional to the square root of the absolute temperature.

③ Effect of Pressure - The velocity of sound is independent of pressure.

Let us consider a mass ( $m$ ), volume ( $V$ ) and density ( $\rho$ ) then,

$$\text{Volume}(V) = m/\rho$$

According to Boyle's  $PV = \text{Constant}$

$$\text{or, } V = \frac{m}{\rho} \quad PV = P \times \frac{m}{\rho}$$

$$\text{Hence, } \sqrt{P/\rho} = \text{constant}$$

and thus the velocity of sound in air or gas is independent of pressure.

The End. ~~continue~~ →