

### Answer on Question #42637-Physics-Molecular Physics-Thermodynamics

Two spheres made of same substance have diameters in the ratio 1:2. Their thermal capacities are in the ratio of? Options are

- (a) 1:2 (b) 1:8 (c) 1:4 (d) 2:1

#### Solution

Thermal capacity of the first sphere is

$$C_1 = m_1 S = \frac{4}{3} \pi r_1^3 \rho S.$$

Thermal capacity of the second sphere is

$$C_2 = m_2 S = \frac{4}{3} \pi r_2^3 \rho S.$$

Thermal capacities are in the ratio of

$$\frac{C_1}{C_2} = \frac{r_1^3}{r_2^3} = \left(\frac{1}{2}\right)^3 = \frac{1}{8}.$$

**Answer: (b) 1:8.**