WS-10 9th integrated

sp. heat

Thank

(1)

(1)

$Q = 30\ kcal \rightarrow \quad m = 15\ kg \quad d\theta = (40-20) = 20°C$

Thermal capacity $= \frac{dQ}{d\theta} = \frac{30\ kcal}{20}$

$= 1.5\ kcal/°C$

(2)

$m = 20 \times 10^{-3}\ kg \ : \ v = 210\ m/s$

Energy $= \frac{1}{2} m v^2 = \frac{1}{2} \times 20 \times 10^{-3} \times (210)^2$

$= 10 \times 10^{-3} \times (210)^2 \Rightarrow 441000 \times 10^{-3}$

$= 441\ J$

$1\ cal = 4.2\ J$

$\therefore$ Energy in cal $= 105\ cal$

(3)

Given $\frac{r_1}{r_2} = \frac{2}{3} \ : \ \frac{s_1}{s_2} = \frac{3}{4} \ : \ \frac{d_1}{d_2} = \frac{4}{5}$

water equivalent $w = MS = d \times vol \times s = d \times \frac{4\pi}{3} \times r^3 \times s$

$\frac{w_1}{w_2} = \frac{d_1}{d_2} \times \left[\frac{r_1}{r_2}\right]^3 \times \frac{s_1}{s_2} = \frac{4}{5} \times \left[\frac{2}{3}\right]^3 \times \frac{3}{4} = \frac{8}{5 \times 27 9} \times 3$

$= \frac{8}{45}$

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