

32 mL of ethanol with an initial temperature of 11 degree C absorbs 562 J of heat. Find the final temperature of the ethanol. (Density of ethanol= 0.789 g/mL)

Solution:

$$\rho = \frac{m}{V}$$

m-mass

V-volume

ρ -density

$$m = V * \rho$$

1) **$m = 0.789 * 32 = 25.248\text{g}$**

$$Q = c * m * \Delta T$$

c-the heat capacity of ethanol(2.46 J/gC- from source)

m-mass

Q-energy(heat)

2) **$\Delta T = Q/m/c = 562/25.248/2.46 = 9.05\text{ }^\circ\text{C}$**

$$\Delta T = T_{final} - T_{initial}$$

3) **$T_{final} = \Delta T + T_{initial} = 11 + 9.05 = 20.05\text{ }^\circ\text{C}$**

Answer: 20.05 °C