10 In an experiment to measure the enthalpy change of neutralisation of hydrochloric acid, $20\,cm^3$ of solution containing 0.04 mol of HC*l* is placed in a plastic cup of negligible heat capacity.

A $20\,cm^3$ sample of aqueous sodium hydroxide containing 0.04 mol of NaOH, at the same initial temperature, is added and the temperature rises by 15 K.

If the heat capacity per unit volume of the final solution is $4.2\,J\,K^{-1}\,cm^{-3}$, what is the enthalpy change of neutralisation of hydrochloric acid?

A $\dfrac{20 \times 4.2 \times 15}{0.04}\,J\,mol^{-1}$

B $40 \times 4.2 \times 15 \times 0.08\,J\,mol^{-1}$

C $\dfrac{40 \times 4.2 \times 15}{0.04}\,J\,mol^{-1}$

D $\dfrac{20 \times 4.2 \times 15}{0.08}\,J\,mol^{-1}$