3 **(a)** Define specific latent heat.

....

....

.... [2]

(b) A dish containing $7.2 \times 10^{-5}\,m^3$ of a substance rests on a laboratory bench. The substance is initially a liquid of density $710\,kg\,m^{-3}$. Atmospheric pressure is $1.0 \times 10^5\,Pa$.

The liquid is heated at its boiling point so that it completely vaporises. The increase in the internal energy of the substance during this process is $17.6\,kJ$. The final volume of the vapour is $0.017\,m^3$.

(i) Show that the magnitude of the work done on the substance when it vaporises is $1.7\,kJ$.

[2]

(ii) Use the information in **(b)(i)** to calculate the thermal energy Q, in kJ, supplied to the substance to cause it to vaporise.

$Q =$ .... kJ [2]

(iii) Use your answer in **(b)(ii)** to determine a value for the specific latent heat of vaporisation L_V, in $kJ\,kg^{-1}$, of the substance.

$L_V =$ .... $kJ\,kg^{-1}$ [2]

(c) The substance in **(b)** has a specific latent heat of fusion L_F.

Suggest and explain whether L_F is likely to be less than, the same as, or greater than the answer in **(b)(iii)**.

....

....

....

....

.... [3]

[Total: 11]