3 **(a)** During melting, a solid becomes liquid with little or no change in volume.

Use kinetic theory to explain why, during the melting process, thermal energy is required although there is no change in temperature.

.....

.....

.....

.....

.....[3]

(b) An aluminium can of mass 160 g contains a mass of 330 g of warm water at a temperature of 38 °C, as illustrated in Fig. 3.1.

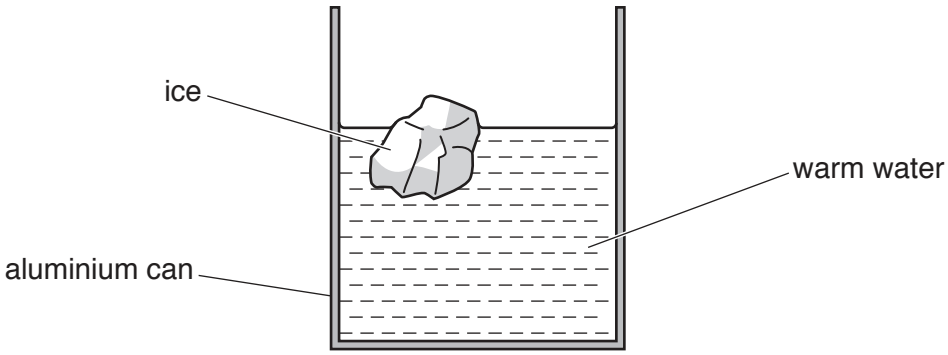

Fig. 3.1

A mass of 48 g of ice at –18 °C is taken from a freezer and put in to the water. The ice melts and the final temperature of the can and its contents is 23 °C.

Data for the specific heat capacity *c* of aluminium, ice and water are given in Fig. 3.2.

	c / J g^{-1} K^{-1}
aluminium	0.910
ice	2.10
water	4.18

Fig. 3.2

Assuming no exchange of thermal energy with the surroundings,

(i) show that the loss in thermal energy of the can and the warm water is 2.3×10^4 J,

[2]

(ii) use the information in **(i)** to calculate a value L for the specific latent heat of fusion of ice.

L = ... $J\,g^{-1}$ [2]

[Total: 7]