Question#19513

70kg of Masa is heated from -24.0c to 85.0c . Her M.p is 10.0c and her boiling point us 95.oC . How much energy did she lose ? Csolid=1500j/kgC , Cliquid =3800j/kgc Cgas =2100 J/KgC Lf 56000J/kg Lv=20000j/kg

Can you please help me answering this question ? Thank you

Solution:

Let:

$m = 70\ kg$

$T_1 = -24°C$

$T_2 = 85°C$

$T_f = 10°C$

$c_s = 1500\ j/kg°C$

$c_l = 3800\ j/kg°C$

$L_f = 2100\ j/kg°C$

Q - ?

$Q = Q_s + Q_f + Q_l,$ *were:* $Q_s - energy\ needed\ to\ heated\ solid,$
$Q_f - energy\ needed\ to\ fusion,$ $Q_l - energy\ needed\ to\ heated\ liquid$

$Q = mc_s\Delta T + mL_f + mc_l\Delta T$

$$\boldsymbol{Q = 70 * 1500(10 - (-24)) + 70 * 2100 + 70 * 3800(85 - 10) = 23667\ kJ}$$

Answer: 23667 KJ.