Answer on Question #65001, Chemistry / General Chemistry

What is the final temperature of 250. milligrams of water at 22.0∘C after it absorbs 133 J of heat?

Answer

1. The water will be heated to 100 degrees:
   $Q_1=mc(t_2-t_1)=0,00025kg*4200J/kg\ °C*(100-22)=81,9J$
2. At 100°C is the evaporation of water
   $Q_2=m*L=0,00025kg*2300000J/kg=575J$ For the evaporation of water is necessary 575J
3. 133-81,9=51,1J - not enough for a full boil
4. As long as the evaporation process the temperature will not rise t_{finish}=100°C
   If you do not take into account the boiling water

$Q=cm(t_2-t_1)$

$t_2-t_1=Q/cm$

$t_2=Q/cm+t_1$

$t_2=133/4200*0,00025+22$

$t=148,7°C$