About heat

Heat energy \( Q \):
- energy exchanged between systems if they have a different temperature
- heat flows from higher to lower temperature
- without temperature difference, no heat is exchanged

If a system is receiving or releasing heat, then this heat is called

a) **Sensible heat**, if the system changes it’s temperature
\[
Q = mc \ (T_f - T_i)
\]
in which \( m \) is mass (g, kg), \( c \) is specific heat \((\text{J/(gK)}, \text{kJ/(kgK)})\), and \( T_f \) and \( T_i \) are the initial and final temperatures, respectively.

b) **Latent heat**, if the system undergoes a phase change and no temperature change
\[
Q = mL
\]
in which \( m \) is mass (g, kg), \( L \) is the latent heat of the phase transition \((\text{J/(g)}, \text{kJ/(kg)})\)

Phase transitions:
1. Fusion, freezing:
   a) Liquid to solid
   b) latent heat of fusion \( L_f \) is released
2. Melting:
   a) Solid to liquid
   b) latent heat of fusion \( L_f \) is absorbed
3. Evaporation, boiling:
   c) Liquid to vapor
   d) latent heat of vaporization \( L_v \) is absorbed
4. Condensation:
   e) Vapor to liquid
   f) latent heat of vaporisation \( L_v \) is absorbed
5. Sublimation:
   g) Solid to vapor
   h) latent heat of sublimation \( L_s \) is absorbed
6. Deposition:
   i) Vapor to solid
   j) latent heat of sublimation \( L_s \) is released