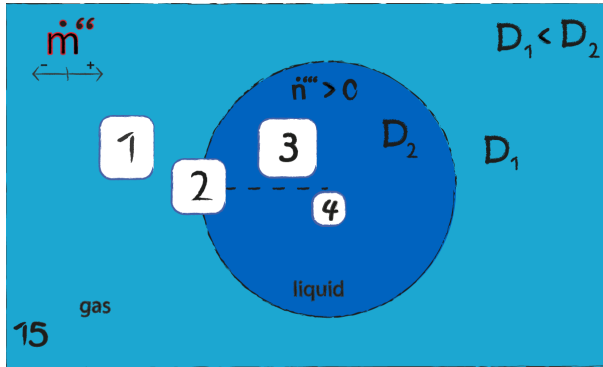


Mass Flux Profile: Task 15



The image describes a circular shaped liquid with a volumetric mass source surrounded by a gas with a greater diffusion coefficient.

1



As there is no mass source or sink within the liquid, mass flux is constant in radial direction. With cross section area decreasing proportional to r , specific mass flux is rising in a steeper manner towards the solid. The fact that mass is transferred towards the gas and hence, is negative is given by the fluid's mass source.

2



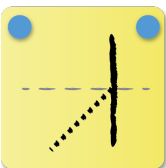
The transition is characterized by a kink in specific mass flux profile, as the mass source causes mass flux to decrease towards the center. In contrast to the concentration profile, different diffusivities have no impact on the specific mass flux's shape.

3



Via a mass balance for the liquid it can be shown, that specific mass flux decreases linearly towards the center.

4



Due to symmetry considerations, mass flux vanishes at the center.