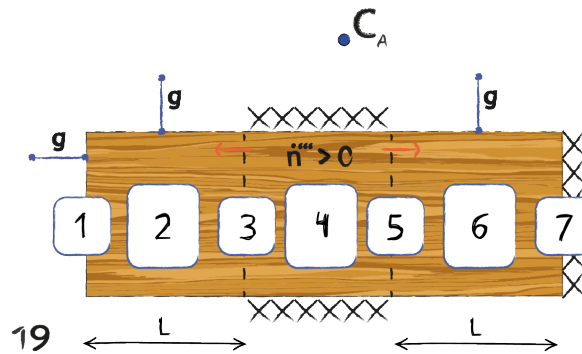


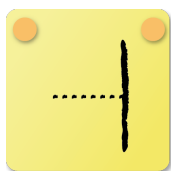
Concentration Profile: Task 19



The image describes a body consisting of three sections. There is a volumetric mass source within the middle section and impermeable boundaries. Left and right sections are characterized by convective mass transport at the boundaries except for the very right edge. Left and right section are equal in length.

- 1 Since mass is produced within the body, convective mass flux points towards the ambient. For boundary 1 that yields a positive concentration gradient in order to satisfy Fick's law.
- 2 As mass is transferred to the ambient by convection, mass flux inside the body increases towards the right, yielding a steeper slope in concentration profile.
- 3 The transition is characterized by a smooth concentration profile, due to equal concentrations and diffusion coefficients.
Since the only mass source of the system is in this section, the maximum concentration is located here. Left and right section are equivalent when it comes to geometry, the only difference being the convective boundary at the very left. Therefore more mass is transferred towards the left section, yielding a steeper concentration gradient at the transition towards the left compared to the right.
- 4 Since the only mass source of the system is in this section, the maximum concentration is located here. Left and right section are equivalent when it comes to geometry, the only difference being the convective boundary at the very left. Therefore more mass is transferred towards the left section, yielding a steeper concentration gradient at the transition towards the left compared to the right.
- 5 The transition is - again - characterized by a smooth concentration profile, due to equal concentrations and diffusion coefficients.
- 6 For the same reasons as in the left section, the absolute value of concentration gradient decreases towards the right and vanishes at the impermeable

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boundary.