A gas separator that makes use of the thermal transpiration in a rarefied gas is proposed, and its gas separation performance is investigated numerically. The separator consists of two kinds of flow channels with different length scales: An array of micro-channels is used to induce the gas separation effect by the thermal transpiration at intermediate Knudsen number, and two larger channels are used to accumulate the extracted molecules by the gas flows with larger flow velocities. Numerical example shows that the molar fractions of a gas in the two larger channels differ by several percent when the Mach numbers are approximately 0.2 there.

**Concept of Gas Separator**

- **DSMC Model**
- **Molecular Exchange Flow** by thermal transpiration in a micro-channel

**DSMC Results**

- **Molar fraction of smaller molecules $\chi$** [arrows: flow velocity $(v_1, v_2)$ of mixture]

**Plans for the future**

1. Use of thermally-driven pumps
2. Use of the main flows in the opposite direction as in the gas separation by thermal diffusion column