

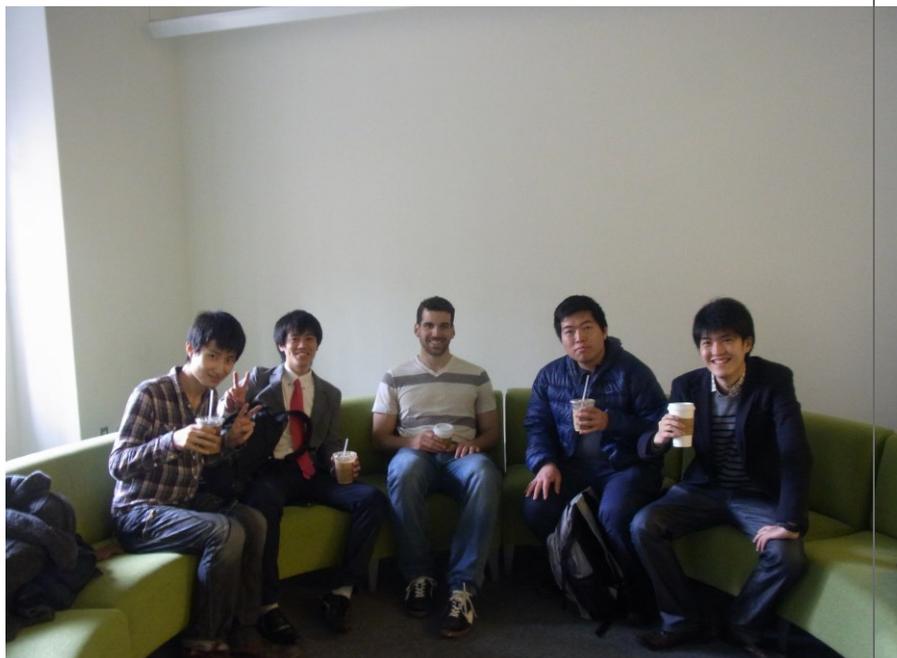
Business Trip Report

Date: April 10, 2015

Name	Hiroshi Takase	Affiliated division	Process Systems Engineering Lab.
-------------	----------------	----------------------------	----------------------------------

The following report describes my activities during the business trip.

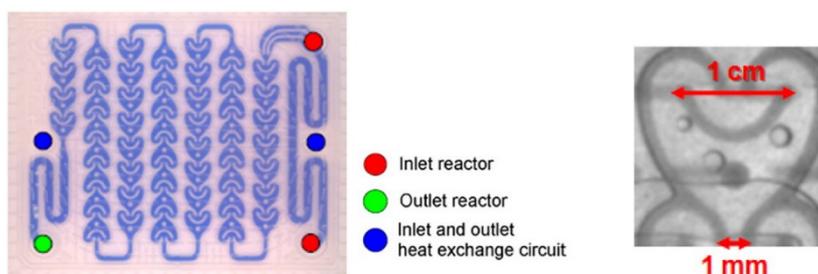
Destinations	Massachusetts Institute of Technology
Period	March 25-29, 2015
Accommodations	Holiday Inn Express Hotel and Suites Cambridge 250 Monsignor O'Brien Highway, Cambridge, MA 02141
Purpose of trip	<ol style="list-style-type: none"> 1) To visit laboratories of Dept. of Chemical Engineering, and observe research facilities in MIT 2) To gather the information needed to lead the study life in MIT. (food, transportation, housing, etc.)
Matters to report	<p>1) Lab. visit <i>Laboratory of Prof. Jamison</i></p> <p>Dr. Frank Leibfarth introduced the facilities. The offices and laboratories are very organized. Since one's desk is next to the room of his/her experimental apparatus, he/she can work very efficiently. There are some discussion spaces between blocks of desks, so that they can have discussions frequently without any reservations. They have high-performance analysis devices, which are replaced every 5-6 years.</p> <p>Dr. Leibfarth introduced the common career plans of the U.S researchers as well. In the US, those who have taken PhD are hired as postdoctoral researcher. In contrast to Japan, it is not common to be hired as assistant professor. After the several years, some of them can be promoted to assistant professor. Furthermore, in order to become professor, they have to win intenser competition.</p>



Coffee break with Dr. Leibfarth (center) after the Lab. tour

Laboratory of Prof. Jensen

Mr. Nopphon Weeranoppanant and his colleagues introduced the facilities. In the SGU workshop in January 2015, I viewed one of their research, which is about typical shape micro reactor, AFR. AFR has many heart shaped cells, and the shape promotes the mass transfer between gas and liquid phases. In this visit, I could watch not only the real device of AFR but also the scale-up version of that. In addition, the utilization of 3D printer was also introduced. We had a discussion about the techniques for the better use of 3D printer.

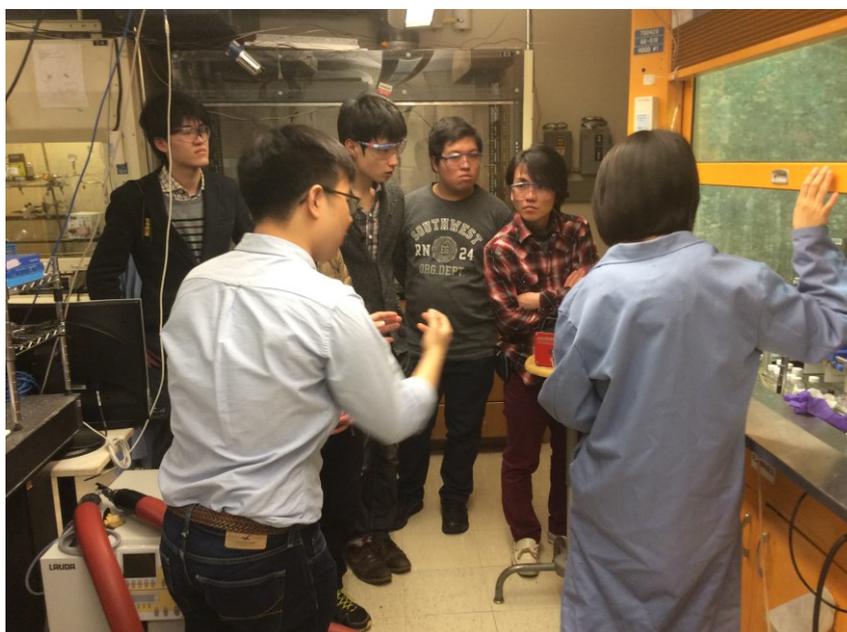


Picture of AFR¹

¹ cited from Nieves-Remacha *et al*, *Ind. Eng. Chem. Res.*, **52** (26), pp 8996–9010, 2013



Scale-up of AFR¹



Discussion in the Lab. tour

2) Information for the life in MIT

In Boston, the commodity price is very expensive compared to Kyoto. People I met in this trip told that one meal (eating out) needs more than 10 dollars, and the common rent of the apartment is more than 100 dollars for a month. Therefore we have to cook our own food and share the room with someone. In terms of food, I found the way to procure the ingredients with inexpensive price. Morning market take place around Haymarket station every Friday and Saturday morning. In the market, we can buy the ingredients such as meats, cheeses, or vegetables.



Cheese shop in the morning market

In addition, the transportation services in Boston are very extensive. We can move around most areas with subway and bus. Even at night, subway is in service. Indeed, I didn't feel stresses in this trip.

Furthermore, we can pay almost all charges by credit card. Therefore we don't have to suffer from troublesome overseas remittance procedure.