

## Basic Seminar for Freshman

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### 1 Basic Seminar

#### 1.1 What is Basic Seminar?

In this presentation, we will introduce the basic seminar that has started this year. This is a course offered to freshmen in the first semester.

The class is designed to introduce freshmen to more advanced studies. Each department of all schools in Tohoku University offers several classes. Students can choose one of them as they like even if they actually don't belong to the department offering the class. For example, a class about problems between environments and law is held in Law School, and an engineering student can take it. Each class has about 20 students.

The class has quite variety. For example, some basic seminars have experiments, some, a practice of something medical, and others, a visit to a company or a camp for study.

#### 1.2 Class schedule

In the first week, we had orientation. In this orientation, professor explained about this course. From 2nd to 5th week, every student of the class had assignments. From 10th to 12th week, the class was divided into groups of four and five. We had a group discussion on environmental problems. In the final week, we visited "Tohoku Ricoh" company. At the factory, we were taught their efforts to reduce wastes. We were impressed they have established ZERO EMISSION.

### 2 What we studied in the class

We studied Fuel Cell. Fuel Cell produces electricity by chemical reactions like a dry cell. But it needs fuel. That's why it is called "Fuel Cell" It uses hydrogen as fuel.

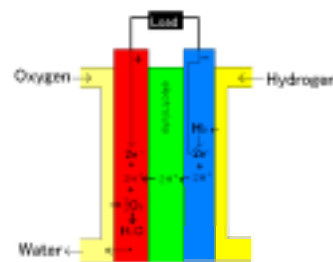


Fig. 1: Principle of Fuel Cell

Today Fuel Cell attracts many attentions, because it is harmless to environment and very efficient. Fuel Cell is expected to be applied to cars, refrigerators, etc.

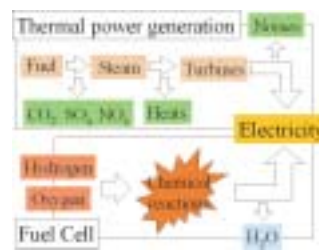


Fig. 2: Way of generation

Figure 2 compares the processes of the power generation of fuel cell and other major power generation systems. We will explain the details in the presentation. The problems are: fuel cells are too expensive to be commonly used and a fuel tank is too heavy to be used. If we focus on the problems about the materials, those are the tasks: Materials for the storage of hydrogen, low cost electrode materials and light weight structural materials.

### 3 What we felt after the course

We realized the importance of Material Science for the development of Environment conscious engineering.