

2009 ITP Project Report

Research at Recycled Materials Resource Center

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In this summer, I studied at University of New Hampshire in the United States, which was the part of International training program supported by Japan Society for the Promotion of Science (JSPS). Within 2 months, I could get lots of amazing experiences at Research at Recycled Materials Resource Center. My life in New Hampshire, and research activities are reported in this paper.

1. Introduction of New Hampshire and other surrounding areas

Location in New Hampshire

UNH is located in Durham which is one of the town in New Hampshire. In order to get there, we first have to go to Boston by plain via other major airports. (There is no direct flight from Japan to Boston.) And then, state-operated railroad named Amtrack, or intercity bus will take you to Durham and other surrounding areas.

Boston is one of the most famous in Japan for the sightseeing city. However, Portsmouth, where Treaty of Portsmouth was signed, is also well-known city for Japanese. If you go to New



Figure1. Location of New Hampshire

Hampshire, you will enjoy Both American history and Japanese history there.

Durham

Durham have a lot of nature and huge space. Almost all of citizen are students of UNH because Durham is the town for University and for students with some restaurants, convenience stores, and a supermarket. During 2 months, I could live in comfort there. After I got the temporary ID card for students of UNH, it made me ride some local busses for free, which I found so convenient that I always took them. When I wanted to go to Boston, they cost me only 8 dollars to get there with ID cards.



Picture1. Pictures of Portsmouth(upper left)、 Boston (upper right) ,
and Durham (lower two)

University of New Hampshire

When I went to University of New Hampshire at the first time, I was so much surprised because it had a great view. They integrated their building type with warm, quaint hue. They are also very sensitive to maintain their public order and security, so all of students can live and study on campus safely.

Many kind of sports are done actively. UNH has some ground for football, grid, tennis court, and other institutions. Especially ice hockey is the most popular sport and UNH is very famous, powerful team all of the United States.



Picture2. University of New Hampshire

Recycled Materials Resource Center

In my 2 months, I lived and did my activities at Recycled Materials Resource Center, which is the part of buildings at UNH. In this part, I introduce three persons who has done for me.

1) Associate Professor Kevin Gardner

Kevin Gardner who is the director of Recycled Materials Resource Center helped me for my stay and study at UNH. From my first to last, I owed him many obligation, direct and indirect.

2) Scott Greenwood (Research Scientist)

Scott Greenwood is total manager for RMRC laboratory. He also supports some experiments for many students in RMRC. I also owed him everything about my experiments in this 2 months.

3) Maddy Wasiewski (Administrative Assistant)

Maddy Wasiewski is a business assistant at RMRC. She helped me when I worried especially about my stay, accommodation, and so on.



Picture3. Recycled Materials Resource Center
(Gregg Hall)

2. Research activity at RMRC

Sampling at Franklin landfill site

During my stay, there were two research that I did. In this part, I introduce one of them, sampling at Franklin landfill site. This is the joint research between Kyushu Univ. and Univ. of New Hampshire that is supported financially by Japan Society for the Promotion of Science (JSPS). Franklin is the small town near New Hampshire and municipal solid waste incineration (MSWI) residues have been mainly landfilled in this landfill site. In this study, CO₂ sequestration capacity of landfill sites that municipal solid waste incineration (MSWI) residues have been landfilled mainly would be investigated. CO₂ sequestration capacity of landfill sites in the US and Japan would be compared to confirm whether difference of residue contents and climatic environments has significant influence on CO₂ sequestration capacity or not.

From Sep. 7 to Sep 13, I as well as our lab members went to Franklin landfill site and sampled. Now, we have been analyzing these samples with various method.



Picture4. Sampling at Franklin landfill site

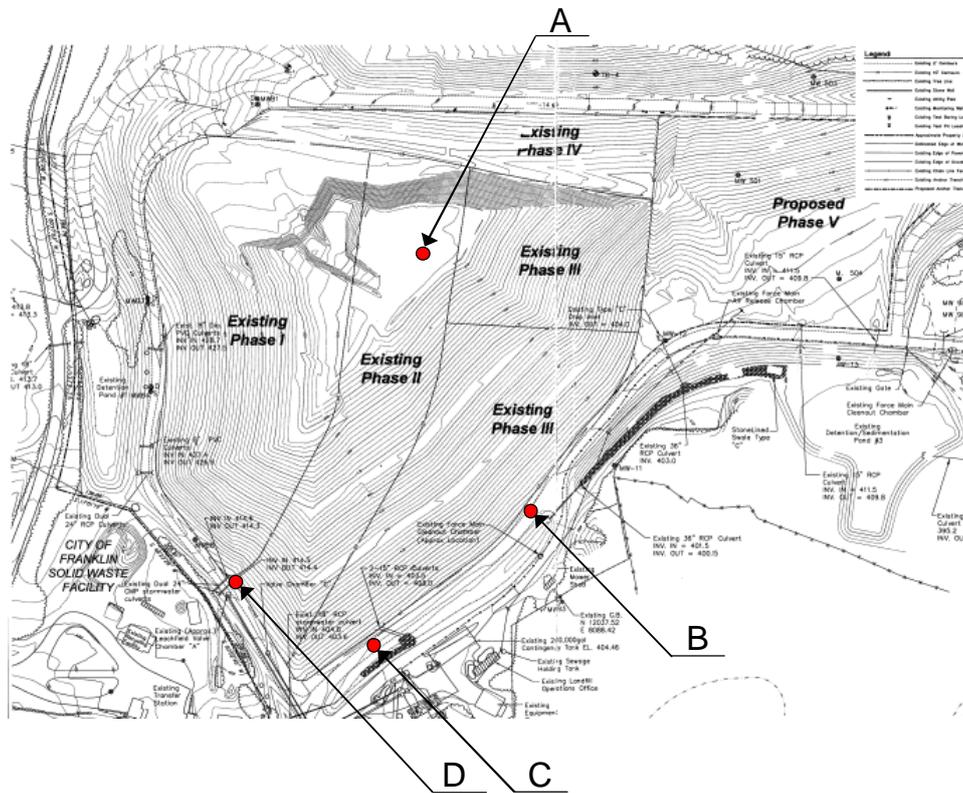
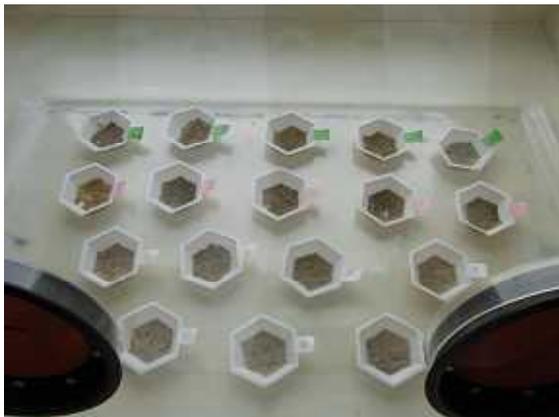


Figure2. Plain view of Franklin landfill site

Carbonation test of N-light

Second research is carbonation test with N-light. N-light is the recycled material of inorganic construction sludge, which is produced by Japanese company named Najima industry construction. I investigate their saturated CO₂ contents because we wanted to know whether N-light can absorb carbon dioxide in the atmosphere as much as it can be good for environment. Picture5 shows you the way to make samples absorb CO₂ entirely. After saturated, I analyzed their amounts of CO₂ contents by chemical measurement by using barium hydroxide.

Figure3 and figure4 are conclusions. N-light were sampled twice (November and December), and Nov. samples have a little more amounts of CO₂ contents than Dem. Samples. Figure3 shows that N-light have more ability to adsorb than construction sludge, which means they can become good for environment. We can get this reason from figure4. It means that the more amounts of Ca N-light have, the more ability to absorb CO₂ they get. From these result, Whether N-light is good for environment or not depends on the amounts of Ca and we have to find the way to gain the amount of it in the next step



Picture5. Carbonation test of N-light

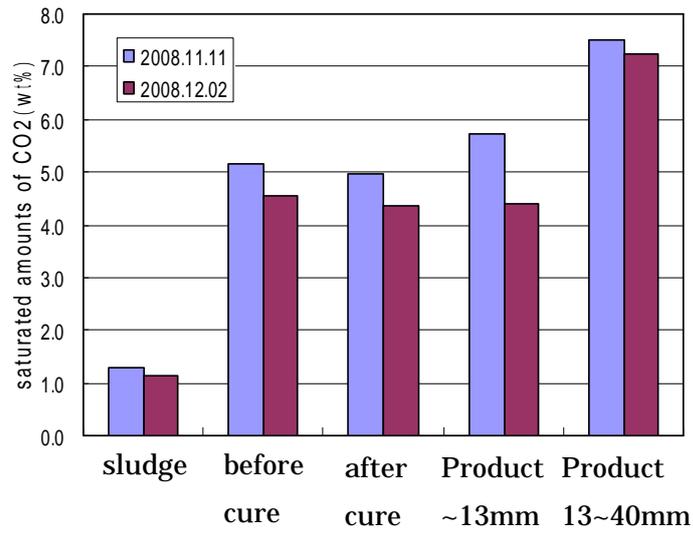


Figure3 Saturated amounts of CO2 contents
At manufacturing process of N-light

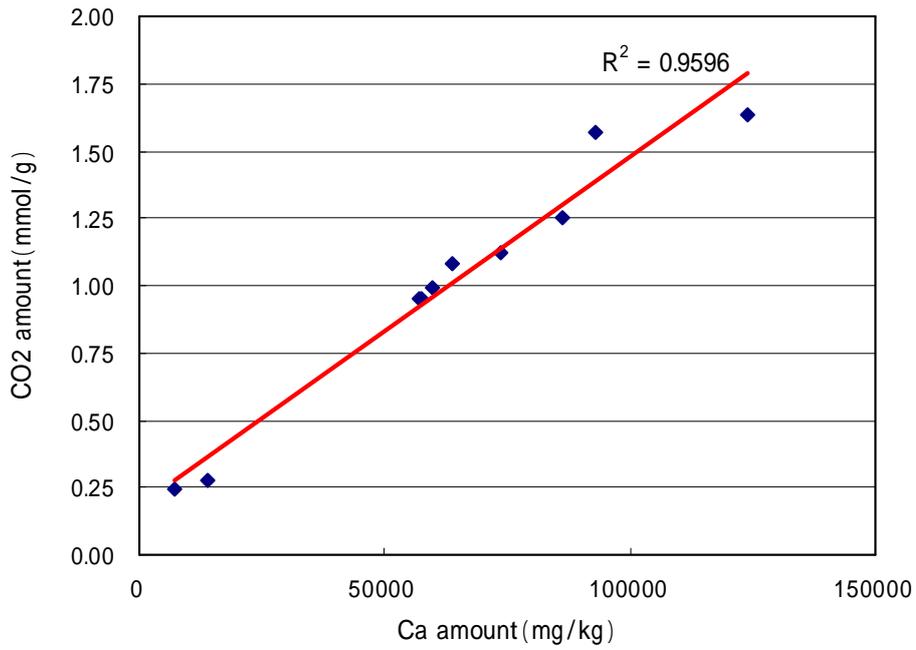


Figure4 correlation between CO2 amounts and Ca amounts