



アラカト

講演大会学生ポスターセッションに参加して

第172回日本鉄鋼協会 秋季講演大会学生ポスター セッション最優秀賞を受賞して

Getting “The Best Poster Award of
Poster Session for Students”
in 172nd ISIJ Meeting

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1. Introduction

It is my great honor to have an opportunity to present my research in the poster session for students of 172nd ISIJ meeting held at OSAKA University and received the best poster award with the topic “Latent heat storage microcapsule for recovery of high-temperature exhaust heat in steelworks”

2. About My Research

Nowadays, the energy saving becomes the major issue of concern in every sectors. The tremendous amount of waste heat is released especially from industry section. Utilization of waste heat, in other word the way to use energy more efficiently, has been extensively studied and analyzed in order to develop a better approach to tackle with this. Among several technologies proposed, Phase change material (PCM) is one of the most prominent ways for waste heat recovery.

As the name implies, Phase change material (PCM), also

called Latent heat storage material, absorbs and releases heat at certain temperature range through the solidification and melting process. The PCM is widely recognized and accepted as a high heat storage density material. In steel industry, remarkably high exhaust temperature is available. At this temperature, heat quality, exergy, is so high that heat recovery should be considered.

My research focus on PCMs developed from Al-Si alloys because of its high latent heat, thermal conductivity and melting temperature ($\sim 580^{\circ}\text{C}$). The recovered heat is appropriate for high temperature applications, for example, steam reforming of natural gas. Al-Si microspheres were encapsulated with alumina shell and 10 cycle-tests were also performed under air atmosphere. The morphology and thermal storage capacity were observed in both as prepared and after 10 cycles samples. In this study, the Al-Si microencapsulated PCMs demonstrate a great potential as MEPCMs for using in high-temperature thermal energy application. The MEPCMs provide a large heat storage capacity which is several times larger than sensible heat storage material's.

3. Research Life

As foreign student, I had to adapt myself to familiarize with Japanese environment, it is not only the daily life but also academic and research life. Most of relevant document and manuals are written in Japanese, so, I cannot clearly understand the contents by myself. Fortunately, I have been surrounded by many supportive members. First of all my advisors, Professor Tomohiro AKIYAMA and Associate Professor Takahiro NOMURA, always support and give me a lot of advices about both personal and academic matters. Their hard work and dedication to research have inspired me to carry out the research. In my laboratory, students can share the results and future plan to others and make some discussions in bi-weekly meeting. Every time we found problems or difficulties, we will try to find out the best solutions together. Moreover, my laboratory mates also taught me many things about Japanese matters, e.g. foods, culture, language. They also took me to many places for some activities. I am blessed being a part of this laboratory where I can enjoy both Japanese environment and my research life although I am living in unfamiliar country.

Lastly I want to devote this award to all laboratory members and my family. Without them I could not have been smoothly carried out this study. Getting this award makes me feel that I am on the right track and my research is able to be a part of energy management and contribute to sustainable and green societies.



Lab members in 2016 Summer Meeting

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