We prepared a number of thin sections from samples of the breccias and melt fragments at Takamatsu, and of the granites located on the exposed SE rim of the buried crater, and we have been working on these materials. We discovered highly fractured granitic fragments, with possible planar deformation features (PDFs) indicative of shock-wave effects. The Rhyoke Granite surrounding the crater shows features of severe shattering and shear, suggesting very violent phenomena such as expected from an impact.

Remote sensing data and compilation of geophysical data from the crater area are being used by Dr. Miklos Kedves (a post-doctoral student working under Prof. Miura) to help define the crater dimensions and the processes involved in the formation of the crater. Although the original crater diameter, based on the gravity study, was estimated to be ~4 km, our studies suggest an outer ring at ~8 km diameter in the Rhyoke Granite bedrock. This work has implications for exploration for petroleum and natural gas at buried impact sites.

Materials produced by impact shock waves include shocked quartz and other minerals, high-pressure silica polymorphs (e.g., stishovite), impact-melt glass, microspherules of various kinds, and Ni/Fe grains. We are searching for such evidence of shocked minerals and/or extraterrestrial geochemical markers at the Triassic-Jurassic and Permian-Triassic mass-extinction boundaries. In our studies, we analyzed material from the T-J boundary in the Inuyama sections, and thus far have found some spherule-like grains that require further study. Samples from the Sasayama Permian-Triassic section taken last year were analyzed by a our colleagues at the University of Hawaii who discovered fullerenes (60C and 70C) of possible extraterrestrial origin. The fullerenes apparently trapped rare gases (He, Ne, Ar) of non-atmospheric composition within their cage-like structure, suggesting a meteoritic component, and possible impact event, at the Permian-Triassic mass extinction event. Such trapping of atoms in fullerene "cages" may have valuable technological applications.

Teaching, students, education

During my stay at Yamaguchi, I presented several lectures on earth and space science to Prof. Miura's classes, made a presentation to new students that generated interest to pursue research in this area. I also gave a seminar in the Earth Science Department on impacts and shock effects. The IFIE Meeting was attended by a large group of students from Yamaguchi University, and I presented several talks on our research in Japan and elsewhere. In the field, I worked with students who are doing research on Takamatsu Crater, and on spherules from the Niho Meteorite shower site. In the laboratory, we taught the students to recognize various features diagnostic of shocked materials under the petrographic microscope.

Summary

I spent a very productive three months in Yamaguchi, and enjoyed my stay and work at Yamaguchi University enormously. This was made possible by the great efforts of Prof. Y. Miura in organizing research, field trips and the International Forum meeting. I am very grateful for the financial support and to Dr. H. Hironaka, President of Yamaguchi University, the Director of VBL, and the Dean of the Faculty of Science for accepting me as an employee of the Venture Business Laboratory.
I hope that we can continue this fruitful collaboration, and that I can invite Prof. Miura to spend time in New York. I also hope that we can continue plans to create an exchange program for faculty and students in various disciplines between New York University and Yamaguchi University.

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(2) My visit of Yamaguchi University, Process Design Engineering Laboratory, Department of Chemical Engineering, March, 2001

Professor Wen-Yih Chen

Department of Chemical Engineering, National Central University, Chung-Li, Taiwan

世話教官：工学部・応用化学工学科教授　山本　修一

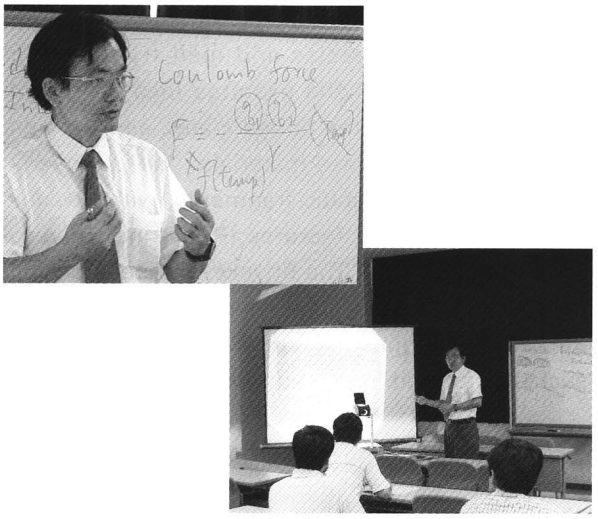
Introduction

It is really honored and great pleasure for me to have this visiting opportunity to Yamaguchi University and Prof. Shuichi Yamamoto's laboratory. This visiting opportunity provided by Prof.

Yamamoto and Yamaguchi University is really one of my highlight of my research career and I would say that this visiting application is sparked by my interests in the understanding of the binding mechanism of ion-exchange chromatography for protein purification. Prof. Yamamoto has contributed his research emphasis on the subject for more than 10 years and I have a lot of chances, in literatures or in conferences, to keep track of the development of Prof. Yamamoto's outstanding publications. Therefore a first hand contact and expose myself into his laboratory should be a great impact for me. This visiting idea was also stimulated by the successful visiting experience of Prof. Hwai-Shen Liu from National Taiwan University in Prof. Yamamoto's laboratory. The application started from the end of 1999 and it became true and practiced at June 19 to July 21, 2000. Prof. Yamamoto has also decided to allow me to take one of my Ph.D. students with me and the practice of this attempt has proved to be very successful. Mr. Fu-Yung Lin, my Ph.D. student, spent the same period of time as mine in Yamaguchi University. This is his first stay out of country and I believe that he has gained some good experience both in research and in culture.

Brief of the stay

During this delicate month, I had a chance to teach undergraduate students English technical writing, which I think we should also do the same training backhome in Taiwan. I also lectured "The mechanism studies of the chromatography bioseparation by Microcalorimetry" in the Ph.D. program. Most of the Ph.D. students were part time student from industry, so the progress of the classes was full of idea and information exchange. I believe that I have done my best and I have benefited from the lecture as well. The topic of the lectures was selected specifically both from my teaching experience at my University and, more importantly, for the research cooperation between my group and Prof. Yamamoto's research group. From the teaching materials, I was hoping that we could develop a research link in the aspect of thermodynamics understanding of the ion-exchanger behavior. We devoted time to discuss and design a project based on Prof. Yamamoto's previous studies, and we have fortunately finished the project and published the results. The title of the paper is " Microcalorimetric Studies of the Interaction



Mechanisms between Proteins and Q-Sepharose at pH near the Isoelectric Point. Effects of NaCl Concentration, pH value and Temperature" and was published in the Journal of Chromatography A 912(2), 281-289 (2001). Following related research projects in the area of the hydrophobic interaction of ion-exchange resin are still undergoing.

I was also arranged by Prof. Yamamoto to see different Professors and researchers in Yamaguchi University. For this, I have a great chance to exchange ideas with some of the outstanding researcher. The highlight of this visiting was the Golden-Conference-type get together of the 3rd Ube meeting - "Seminar on Bioprocess and Bioseparation Engineering" held at the newly built Lecture hall D in Yamaguchi University at July 19. In the meeting I had chances to meet famous Dr. Yoshio Kato from Organo (Tosoh) and my old friend and "shen-bai (Senpai)" Prof. Shigeo Katoh from Kobe University. The atmosphere of the meeting was friendly and the discussions were enthusiac. This kind of get together has attracted more and more related researcher from different part of world to come and to share the research results and it will be developed to one of the important meeting of bioseparation area in the future.

Other aspect such as the student's attitude toward learning and toward teacher was one thing that Prof. Yamamoto and me have talked about. The wonderful feeling and experience with the Japanese students have influenced me deeply and this has also reminded me a lot from my parent's talks in their school year and in Japanese academic system. I would like to take this chance to thank them for their companies.

Future collaboration

For my stay, Prof. Shuichi Yamamoto provided me a spacious room, right next to his office. Thus, we had quite a few chances to exchange research idea and discuss the differences of student's attitude toward study and school systems between two countries. We used to have this kind of talk at evening and sometime it was almost approach mid-night. After each talk, in the way back to my stay or even in my dream, some of the conversion popped up and kept me thinking. As stated previous, we are working the hydrophobic interaction of ion-exchange resin together and I am sure further comments and suggestions from Prof. Yamamoto in this aspect or other possible research projects should benefit my research group greatly.

Summary

I would like to express my deep appreciation toward Prof. Shuichi Yamamoto and his family for kind arrangement of my visit. Acknowledgement is also extended to Yamaguchi University, all the friends (Drs. Takashi Saekei and Kazuhiro Tanaka) and students. I also would like to thank Ms.Kaori Okada for her kind assistance to my living environment in Ube. I hope my visit was beneficial for Prof. Yamamoto and Yamaguchi University. I believed, in any aspect, this visit is the milestone for me to understand Japanese culture and society. I look forward to further correspondence.

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(3) Visit of Yamaguchi University, Department of Electrical and Electronic Engineering Ube City, August 14 - September 29, 2000

Assoc. Prof. P. Maly

Department of Chemical Physics and Optics, Faculty of Mathematics and Physics, Charles University, Prague, Czech Republic

世話教官：工学部・電気電子工学科教授　三好　正毅

Introduction

It is very nice to meet people from other parts of the world working on the same problems in the research. It is even better if some of the meetings turn out to be a beginning of the future collaboration. Fortunately, this was the case of my meeting with Prof. T. Miyoshi during his participation at the International Conference on Luminescence in Prague during summer 1996. There was a large overlap between his and my research interests. Prof. Miyoshi invited me in 1997 to visit his group at Yamaguchi University. I was very pleased that I was able to spend there nice five weeks which turned out to be very useful from both scientific and general points of view. Besides throughout scientific discussions, we performed joint experiments on photodarkening in semiconductor-doped glasses, the results were published in a joint paper [1]. A year later, Prof. T. Miyoshi visited my laboratory in Prague where we carried on the experimental work concentrated on the carrier dynamics in CdS doped glasses and we prepared another joint paper for publication [2]. I was very happy that I was able to come again to Yamaguchi university this year. I was appointed Assoc. Prof. of the University from August 14 to September 29, 2000. The main program of the visit was the experimental research of ultrafast carrier dynamics in semiconductor nanocrystals.

Research

My field of research is ultrafast optoelectronics. In particular, I concentrate on the II-VI semiconductor compounds as CdS, CdSe and CdSSe. These materials are considered to be very prospective in optoelectronics, e.g. for ultrafast all-optical switching. They are also very interesting from the viewpoint of basic research as systems in which charge carriers are confined in all three dimensions (quantum dots). The materials have typically optical nonlinearities with large magnitudes and fast response times.

There is a variety of preparation techniques of semiconductor nanocrystals. Recently, we have implemented preparation of CdSe, CdS nanocrystalline thin films by chemical bath deposition in Prague. We have used this technique for production of high quality thin films of CdSe and CdS nanocrystals with variable radii. The preparation of the sets of samples of nanocrystalline films with various nanocrystal sizes make it possible to study in detail the recombination and relaxation processes in the nanocrystals.