

Form B-5

Date (日付)

09/02/2018 (Date/Month/Year: 日/月/年)

Activity Report -Science Dialogue Program-

(サイエンス・ダイアログ事業 実施報告書)

- Fellow's name (講師氏名): Muniyappan Rajiv Gandhi (ID No. P16353)

- Participating school (学校名): Akita Prefectural Yokote Seiryō Gakuin Senior High School

- Date (実施日時): 06/02/2018 (Date/Month/Year: 日/月/年)

- Lecture title (講演題目): Recycling of Rare Metals from Secondary Waste Resources

- Name and title of your company (同行者 職・氏名)

Baisui Han, PhD Student (D3), Graduate School of Engineering and Resource Science,
Akita University, Japan.

- Lecture format (講演形式):

◆Lecture time (講演時間) 60 min (分), Q&A time (質疑応答時間) 20 min (分)

◆Lecture style (ex.: used projector, conducted experiments)

(講演方法 (例: プロジェクター使用による講演、実験・実習の有無など))

I used a projector for PPT presentation, demonstrated 3D structure of calix[4]arene using molecular structure model and exhibited few samples of secondary waste resources containing rare metals.

- Lecture summary (講演概要): Please summary your lecture 200-500 words.

At the beginning of my lecture, I have briefly given introduction about myself and nature about my country (India). I revealed my motivation for becoming a scientist, and then I spoke my life as a scientist in Japan. Further I shared basic story of my research content and interesting facts about my research. My lecture fully focused on general and advanced techniques involved in the recycling of a variety of consumer and industrial recyclable products containing platinum group metals (PGMs), as well as rare-earth metals (REMs).

In the second part the lecture, I described the pyro- and hydrometallurgical processes used for recovery of PGMs from spent automotive catalyst. I clearly explained the disadvantages of pyrometallurgical processes. I also spoke about the advantages of hydrometallurgical extraction process such as low temperature process, cheaper, easier operation and possible to recover all

the metal ions. In the third part, I covered the disadvantages of conventional solvent extraction reagents for PGM recovery. The issues of commercial extractants used in refineries for separation of Pd, Pt and Rh such as slow extraction rate, low durability and incomplete mutual separations were also discussed.

In the fourth part, I gave information about the simple hydrometallurgical processes developed by our group which involving only acids and oxidising agents to leach PGMs/REMs from spent automotive catalyst. After that I shared my current JSPS fellowship research work on “innovative development of platinum group metal recycling by amide modified macrocyclic extractants” based on fundamental coordination and supramolecular chemistries for the selective recovery of platinum group metals from acid leach solution of spent automotive catalyst using solvent extraction process. During the lecture, I have demonstrated the 3D structure of calix[4]arene macrocyclic compound using molecular structure model and exhibited few samples of secondary waste resources containing rare metals.

◆Other noteworthy information (その他特筆すべき事項):

I had a discussion with school principal and teacher in-charge regarding content of lecture prior to my lecture. It was very helpful for my lecture. They also provided very good hospitality.

- Impressions and opinions from a company (同行者の方から、本事業に対する意見・感想等がありましたら、お願いいたします。):

The lecture on “Recycling of Rare Metals from Secondary Waste Resources” was very well-organized and well-prepared in very simple form, so it was easier for 11th grade students to understand it.