2017/2/22

Introduction of Miyazawa Laboratory

Department of Materials Science, School of Engineering, Tokai University

Name of Professor: Yasuyuki Miyazawa　宮沢 靖幸

E-mail: ymiyazawa@tokai-u.jp

Office phone#: +81-463-58-1211, Ext.4208, 4213

4-1-1, Kitakaname, Hiratsuka-shi, Kanagawa-ken, 259-1292, JAPAN

1. Research Field

Miyazawa Lab is Joining Science Research Laboratory.

The research field is the joining science. There are some methods in the joining technology and these joining method are chosen by the using material and the necessary function. In the laboratory is studied for the brazing, soldering and diffusion bonding. In addition, the development research of new function material which applied joining technology is also carried out.

2. Research Topics at 2017

(1) Brazing of Stainless Steel with Ni-based Brazing Filler Metal for Automobile Fabricating Field.
(2) Estimation of Corrosion Resistance at the Brazed Joint with Electrochemical Method.
(3) Brazing of Cu & Cu Alloys.
(4) Observation of Void at the Brazed Joint with X-ray CT Equipment.
(5) Brazing of WC-Co materials to conventional materials.
(6) Low temperature bonding by nano-Ag particles
(7) Investigation of Crystal Grain Orientation at the Brazed Joint with EBSD.
(8) Brazing of C/C.
(9) Joining of Dissimilar Materials with Hybrid Joining Technology.
(10) Investigation of Brazing Technology with Charcoal at Ancient Egypt times.
(11) Brazing of Lead to Steel for building and civil engineering products.

3. Research Topics in future

(1) Effect of Current Load to Soldering Joints with Lead Free Solder at Room Temperature.
(2) Joining of Dissimilar Metal with Spot Brazing Technology.
(3) Development NEW Joining Method for Fabricating Field.

4. Research Achievement

(1) Journal Publication & Proceedings of International Conference, 32 papers from 2010 to 2015.
(2) Conference Presentations & Invited Lectures, 54 from 2010 to 2015.
(3) Collaborative Investigations with Fabricating Companies, 9 Companies.

5. Staff

1 Professor
2 Technicians (Department stuff) and 1 Office administrator (Department stuff)
No assistant
11 Mater Students & 12 Bachelor Students

6. Equipment at our Lab.

BRAZING & JOINING

1. Electrical Atmosphere Furnace and Vacuum Furnace and Vertical Type Furnace with Rotating Special jig.
2. Spot Brazing System.
3. Special Brazing Equipment with Charcoal as a Heat Source for Ancient Egypt Time Brazing.
4. Soldering System with Hot Plate equipment.
5. Electrical Current Loading System at Room Temperature.

ESTIMATION & ANALYSYS

6. Cross-section Observation System,
   Cutting & Mounting & Polishing & Automatically Polishing & Etching & CP (Ion Polishing) & FIB.
7. Observation System, Optical Microscope with CCD camera & SEM & Stereoscopic Microscope.
8. Analysis System, SEM+EDX & SEM+EPMA & SEM+EBSD & XRD & X-ray CT.
9. Mechanical Properties, Tensile & Fatigue at high temperature & Impact & Hardness at Room and High temperature.
10. Thermal Analysis System, DTA & DSC & TG & TMA.
11. Solder Checker.

7. Fundamental Study Topics in Miyazawa's Lab

You will study following topics, which are important metallurgical knowledge and skills, in Miyazawa lab.

1. Fundamental of Joining Technology for Fabricating Field
2. Fundamental of Brazing & Soldering Technology
3. Technical Visit to Some Fabricating or Joining Company if you need
4. Fundamental of Analysis Method & Technology
5. Practical training of Analysis Method at my university's analytical center with special technician
6. Fundamental of Phase Diagrams for Metals & Alloys
7. Fundamental of Metallurgy not Materials Science

That's all