Institute of Light Metals (ILM) Joint Usage/Research Grant Report in FY 2023

2024/00/00

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| Principal investigator | Affiliation | Norwegian University of Science and Technology |
| Job title | Professor |
| Name | Randi　Holmestad |
| Collaborated researcher of ILM | Affiliation | University of Toyama |
| Job title | Associate Professor |
| Name | Seungwon LEE |
| Title of the joint research | Effect of homogenization treatment on age hardening behavior of extruded Al-Mg-Si alloys |
| Joint research Program※check the box | □　Program for Joint Usage / Research Centers (JURC)☑　Program for International JURC□　Program for providing samples and materials□　Program for using ILM facilities for sample analysis and characterization | □ Focused themes☑ Transportation□ Biomaterials□ Bridge/building materials□ Kink strengthening□　Independent research theme |
| Name of joint usage apparatus | Casting,　TEM |
| Total amount of grant | Travel expense（　240,000　JPY） | Consumable Fee ( 60,000　JPY） |
| **Research Results**　**※Please describe following three items briefly.**【The major results】This research is an expanded version of the search conducted last year on changes in mechanical properties during final aging depending on the presence or absence of homogenization treatment. This study is about the effect of homogenization treatment on the final mechanical properties of hot-extruded aluminum alloy.・When the extruded material was solution treated and then artificially aged at 473K, no significant change was observed in the hardness of the non-homogenized and air-cooled material.・At the same aging time, the air-cooled material was observed to have a higher precipitate density and shorter length.・At aging times of 64 and 200 minutes, the β'' phase was observed in both the non-homogenized and air-cooled materials.・At an aging time of 1000 minutes, the β' phase was observed in both the non-homogenized and air-cooled materials.【Future Prospects】This study quantitatively evaluated the effect of homogenization of aluminum 6xxx series alloy on the microstructure and mechanical properties after continuous processing. The chosen processing process is hot extrusion. Research is needed to find the optimal heat treatment conditions with or without homogenization treatment through microstructure observation and changes in mechanical properties.【Concrete results】Since 2020, Prof. Holmestad has promoted the SumAl project, a meeting for Aluminum researchers worldwide. We also participate in it. |
| **Notes**・Please use the form and submit to ILM office (mrc@kumamoto-u.ac.jp) by Friday, April 28, 2023.・The joint research report will be published in the ILM joint research report (annual report) and will be available on our website. Therefore, please prepare the contents for public release accordingly.・Please add pages, if needed. |