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## 高温LiPb強制循環ループを用いた材料共存性研究
## Material degradation study using Li-Pb loop

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Reduced activation ferritic martensitic steels are the candidate materials for making blanket module with liquid metal coolant in fusion reactor. Particularly, F82H steel has attracted attention because of the excellent properties under neutron irradiation at high temperature below 700℃. However, the compatibility data of F82H in liquid Li-Pb is considerably limited. The present study investigates the corrosion behavior of F82H located in the Li-Pb loop of Kyoto University. Fig. 1 shows a schematic view of the loop system. The F82H sample was put in one of the test sections, which was filled with Li-Pb, at temperatures below 650℃, average 550℃. After testing, the cross-section surface of the material was observed by SEM, EDS and EPMA.

Fig. 2 shows the structure of F82H and outer pipe made of SUS316 near boundary with Li-Pb. Liquid flow direction was from the front to the back on the Photos. The boundary between F82H and Li-Pb has not corroded apparently, although a certain amount of Cr has detected in Li-Pb. Comparing to the boundary between SUS316 and Li-Pb, F82H showed good compatibility with Li-Pb. The authors have also investigated corrosion behavior of the material in the rotating disk apparatus[1]. In this experiment, Cr has been eluted into Li-Pb from F82H. The difference of corrosion behaviour between two machines has been compared.

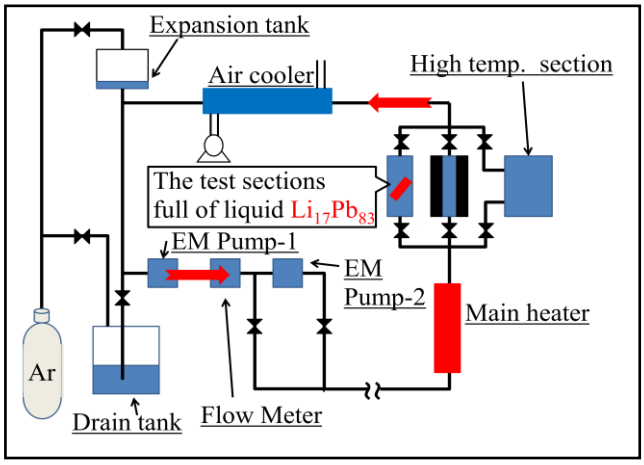


Fig. 1. Flow diagram of liquid Li-Pb loop.

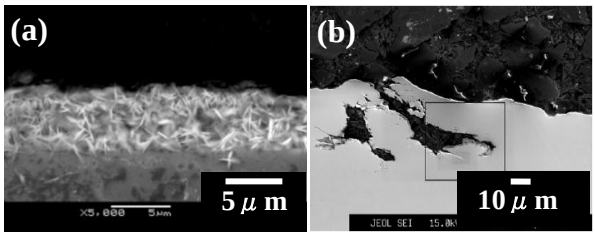


Fig. 2. Surface cross-section for (a) F82H and (b) SUS316 near boundary with Li-Pb after testing in the loop at the high-temperatures.

[1] C.Park, K. Noborio, R. Kasada, Y.Yamamoto, S. Konishi, “Compatibility of SiCf/SiC composite exposed to liquid Pb-Li flow”, Journal of Nuclear Materials 417 (2011) 1218-1220