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Developments of long term reliable high temperature thermoelectric devices

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After the single-crystal thermoelectric SnSe results which showed high figure of merit of 2.6 in 2014 [1], many studies on high temperature thermoelectric materials were followed for a practical application of thermoelectric power generation [2,3]. Despite of the development of these materials, there have been few high temperature thermoelectric devices reported so far, due to the lack of proper metallization technique that can make good electrical and thermal contact at the electrode interfaces.

In this talk, several approaches KIER has been chased to fabricate high temperature thermoelectric modules will be demonstrated. Several metallization materials and processes will be presented especially for the high power density skutterudite devices. The resultant device performances with their long term reliability test results will also be covered and discussed.

References

[1] L.-D. Zhao *et al.*, Nature **508** (2014) 373–377.
[2] Y. K. Lee *et al.*, J. Am. Chem. Soc. **139** (2017) 10887–10896.
[3] Y. Li *et al.*, J. Mater. Chem. C. **4** (2016) 2047–2055.