

## Study on Sodium Leakage Detection using Optical Fiber Sensor

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Sodium leakage accidents in Sodium-cooled Fast Reactor, which utilizes sodium as a coolant, is an important consideration and various detectors are now being investigated worldwide for early detection of sodium leaks.

In this paper, the advantages and disadvantages of an optical fiber sensor compared to other leak detectors are introduced and the points to be supplemented when applied to a sodium experiment environment are described. In particular, the influence of the coating material and the thickness of the cladding material of the optical fiber is demonstrated through the experiment in high temperature environment. In addition, a detection method for minimizing signal loss transmitted from the optical fiber is derived by analyzing the graph of the limit temperature per each coating material under various exposure time conditions in an electric furnace.

The experimental results of this paper will provide a basis for applicability of optical fiber sensor to replace existing leak detectors and will be used for early detection of actual sodium leak accidents.