Measurement of Corrosion Products of 316H Stainless Steel under High Temperature on LIBS System

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Abstract The measurement of corrosion of reactor materials is of guiding significance for the safe operation of reactors and can solve the engineering problem of material failure identification in nuclear power plants. 316H stainless steel has excellent corrosion resistance and is widely used in the core structure and cooling system of nuclear power plants. The LIBS system for high temperature samples was built to measure 316H stainless steel on line. The system can control the ambient temperature of the sample and simulate the reactor condition. The variation of Fe, Cr, C, O and other elements with depth was deduced by combining the pulse times and the depth of the pulse pit, which provided a reference for judging the corrosion degree and corrosion mechanism.

The experimental results accumulate experience and data for the evaluation of corrosion properties of structural materials used in reactors under high temperature environment using LIBS.

Keywords spectroscopy; laser induced breakdown spectroscopy; on-line measurement