



MOLTEN SALT IMPURITY SENSOR

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The Invention

UW-Madison researchers have developed an optical sensor that can be used to monitor trace impurities in molten salts, including FLiNaK, FLiBe, MgCl₂, nitrates, and carbonates. This optical impurity probe is inserted into the flowing molten salt. The design (figure linked below) includes a light source, a diamond viewing window, a mirror, and a spectrometer. The resultant spectra are analyzed (i.e., compared to a reference spectra) to identify and monitor impurity content in the molten salt stream.

The optical sensor can monitor several species of interest, including corrosion products (noted above) and radioactive actinides at concentrations of 20-1000 ppm. The optical probe design has several advantages over existing electrochemical probes, including reduced noise, enhanced material stability and robustness, as well as eliminating species interference.

Molten salts are of interest for use in next generation fusion reactors. Monitoring the status (e.g., purity) of the salt is particularly important, as impurities could lead to unwanted reactions, plugging, poor thermal conductivity, and ultimately, failure of the system. This sensor could be integrated in a heat exchanger loop for in-line, real-time monitoring.

Additional Information

For More Information About the Inventors

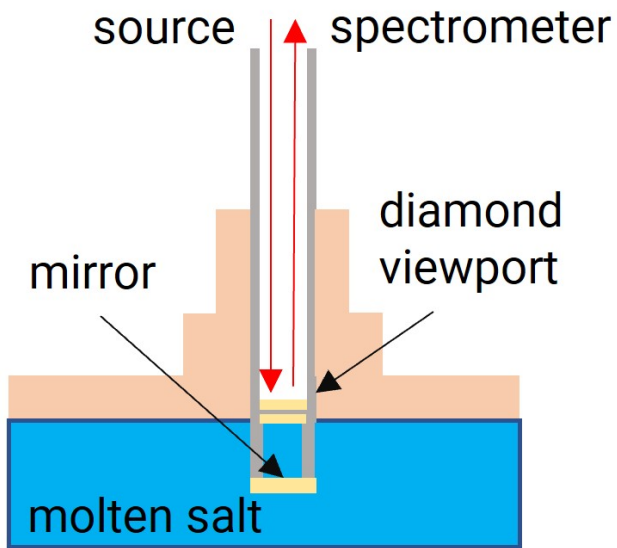
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Tech Fields

- [Analytical Instrumentation, Methods & Materials : Sensors](#)

For current licensing status, please contact Michael Carey at mcarey@warf.org or 608-960-9867

Figures



absorption spectra of molten salts

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