

사용후핵연료 건식분말화 장치 회전축 열 구조해석

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Thermal Analysis on Rotational Hollow Shaft of the Vol-oxidizer for Spent Nuclear Fuel

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Key Words : Vol-Oxidizer(건식분말화 장치), Spent Nuclear Fuel (사용후핵연료), Rotational Shaft (회전축), Thermal Analysis(열해석), Pellets(펠릿), Powder(분말)

Abstract : We are developing a vol-oxidizer which transforms the spent UO_2 pellets into the U_3O_8 power by oxidizing the pellets. To increase the oxidation rate and to get the homogeneous grain size of the powders, we should mix the pellets and the powders by using the rotational shaft equipped with agitating blades. The designed vol-oxidizer handles up to the 20kg UO_2 pellets in a batch at 500°C. This study aims at the optimal design of the rotational shaft based on the thermal analysis considering the internal volume of the vol-oxidizer. We analyzed the thermal stress with three different thickness of the rotational shaft models by using the Ansys. 8.1. To verify the analytical results, we fabricated a rotational hollow shaft and conducted a series of experiments. Also we investigated the oxidation rate and the particle size distribution of the vol-oxidizer equipped with the rotational hollow shaft. Experimental result shows that the designed vol-oxidizer has higher oxidation rate and produce more homogeneous grain size powders as compared with the previously developed one.

스트레인 게이지 계측용 마이크로 프로세서 시스템 개발

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Strain gauge measuring micro processor system development

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Key Words: Strain Gauge(트레인게이지), Microprocessor(마이크로프로세서).

Abstract : The present paper designed a weight measuring instrumentation system in which data conversion and a series of signal processing were totally equipped. 16 strain gauges are incoming sensors and each output of the strain gauge was amplified and filtered for proper analog signal processing. Several measuring instrumentation OP amps and general purposed OP amps were used. 12 bits A/D converters converted analog signals to digital bits and a PIC BASIC processor controlled the 16 channels of strain gauges. RF RS232 modules were used for wireless communication between the PIC PASIC processor and an ethernet host for a remote sensor monitoring system development.