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MODEL 2200 60-SAMPLE OSL READER

FEATURES

60-sample changer on single platter (40 cm diameter).

Sample temperature held at ambient up to 200C for OSL and isothermal decay measurements, up to 600C with heater plate in place of TE sample stage

Unique design prevents exposure of inactive samples to excitation light source.

Integrated IR/green all solidstate OSL exciter (standard with system), with high efficiency bar topology (up to 30 mW/cm² with green LED excitation, and up to 50 mW/cm² IR excitation at 880 nm). **Or:** combination fiber optic excitation with IR LEDs for excellent uniformity and economy of operation up to 30 mW/cm² visible excitation at 10 nm filter FWHM 460-750 nm with 862 Xe arc lamp source, or up to 70 mW/cm² wideband excitation 440-560 nm with 870 halogen source--up to 20 mW/cm² at 514 nm with 32 nm wide filter

Integral beta irradiator (similar to Daybreak 740 but with improved shielding to minimize dark count from bremsstrahlen), with sample elevator.

Optional separate preheat stage (ambient to 300C) is at the irradiation position so that irradiations may be done at elevated temperature for substantial reduction of the fast fading component.



The 2200 automated OSL reader is the latest in the Daybreak TL/OSL family, providing the functions of a sample changer, irradiator, and preheater in a single package. Mechanically simple, like the Daybreak 801E multisample irradiator, the model 2200 has a single demountable 40 cm platter to hold 60 samples. The total

package dimensions are 50 x 50 cm by 10 cm high (plus the PMT barrel height). The top cover, upon which the OSL excitation array, PMT, and irradiator are mounted, tilts up manually for access to the sample platter, which may be loaded in place, or may be removed and loaded elsewhere. A mechanical shutter protects the PMT from ambient light when the cover is up, to minimize recovery time. This also locks the top cover in place during the measurement cycle

The sample is raised from the platter by a temperature-controlled stage (heating plate or optional thermoelectric finger), and light baffles from above and beneath touch the platter to isolate the inactive samples adjacent to the sample under test from any exposure to the excitation light.

For excitation, the 1100IR/G is used (or the 1100FOI or 1100FO/L may be used, plus a choice of 860, 870, or your own light source).

The system controller is the same as that proven in the 1100-series of TL reader systems and is controlled by the same commands. In fact the 2200 is really a differently packaged 1100, without vacuum capability, but with the capacity of the 1150, while permitting extremely flexible irradiation/preheat programs, and optimized for OSL.

The PMT likewise is that used in the 1100-series systems, and the optional 4-filter changer for the detector may be added at a later date if desired. The new IRIS4 four detector system may be used as well.

By making the 2200 a single large platter device, there is sufficient room to place a beta irradiator without the problem of increased dark counts due to bremsstrahlung. We also have re-designed the 740 beta irradiator to include better shielding in the plane of the photocathode. The sample is moved up by an elevator into a shielded irradiation space (15 mm source to sample distance) in order to minimize any exposure to adjacent samples. In the 1100 TL system, this scheme gives adjacent samples less than 0.03 per cent of the active sample's exposure; in the 2200 this is reduced to below 0.02 per cent.

In order to make in-instrument irradiation useful for the single aliquot method of Duller and other like techniques, a preheat is required. It was decided that a separate preheat stage would be effective in reducing cycle time without need of a cooling gas. The controller of the 2200 permits use of a general temperature profile (like the 1100-series instruments) with both sample temperature and preheat/irradiation temperature (if both stages are heater plate rather than a thermoelectric sample stage, but only one is controlled at a given time, as the controller board has a single control channel). This makes it possible and desirable to irradiate at elevated temperature (up to 300C). The sample moves from one stage to the next in sequence under control of the software running on the host computer.

Refer to the paper on the 2200 high capacity OSL reader system for more information about this instrument and its accessories.

NOTE: The 1100 20-sample TL system (with the same OSL excitation accessories as the 2200) is capable of all these functions, although adjacent sample isolation from exciting light, while good, is not quite as complete. The 1150 57-sample TL system can do OSL measurements with a separate lid containing the excitation array, but cannot support irradiation in place. For maximum flexibility with maximum capacity, the 2200 and 1150 complement one another. For flexibility with maximum economy, the 1100 can be configured to give outstanding performance in both TL and OSL.