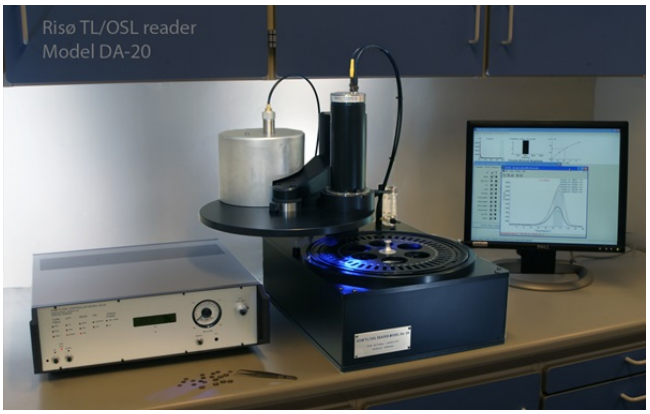
Name of Machine	Luminescence dating facility

Make: RisØ National Laboratory, Denmark	Model: TL-DA-20; RisØ TL/OSL Reader



Specification

- Automated 48-position sample changer system built into a vacuum chamber (lowest pressure < 2×10^{-2} mbar).
- Two exchangeable sample holders (each designed to hold 48 samples) for 9.7 mm diam. flat sample discs or 11.65 mm diam. sample cups.
- Vacuum sensing system with automated switching on reaching desired pressure, vacuum gauge, and combined vacuum/nitrogen solenoid valves (exclusive vacuum pump).
- Lift mechanism for heater element.
- Shaped Kanthal heater strip, endpoint temperature: 700°C.
- Filter holder to allow fitting of different optical detection filters.
- Photomultiplier housing with dynode chain and μ-metal shielding.

Working principle:

Luminescence dating is based on the principle that certain naturally occurring minerals (e.g. quartz, feldspar, poly-minerals); which are previously exposed to ionizing radiation, emit light (luminescence) when stimulated thermally or optically. Luminescence dating requires a proper resetting of the previously acquired (pre depositional) luminescence in the natural minerals into a very low level (natural zeroing event), either by exposure to sun light during pre-depositional transportation (by wind, water etc.) or by a thermal event (pottery making, baking by lava, fusion crest of meteorites), before deposition. Following the natural zeroing event and subsequent burial, the natural minerals begin luminescence acquisition afresh from the ionizing radiation (alpha, beta and gamma) constantly provided by the decay of radioactive elements (U_{238}, Th_{232}, K_{40}, Rb) present in the sediments and also from the cosmic rays.

Application

Luminescence dating provides absolute ages and has very important application in Quaternary geology and archaeology.

User Instruction

The samples must be collected as per the instructions and method given in Morthekai and Ali, 2014. "Luminescence Dating Using Quartz-for End Users, Gond. Geol. Mag., V. 29".

Contact Person

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