

Thermoluminescence emitted from foraminifera

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Foraminifera is a good indicator of global climate change and plays a significant role to reconstruct the past glacial-interglacial cycle. This study examines applicability of thermoluminescence (TL) method to directly measure its shell formation age.

Calcarina and *Baculogypsina*, both included in souvenir "star sand", were irradiated by gamma-ray and TL color images (TLCI) were investigated. They emit red luminescence upon heating. XRD analysis shows shells are calcite. Similar TL glow curves are obtained for a single shell or multi-shells, and TL emitting temperatures are around 120°C and 320°C. When shell was powdered, TL intensity was high and peak temperature shifted to a lower temperature range, due to large area of sample spread on a measurement disc and effective heat transfer to the sample. Lower signal around 120°C is unstable and disappear when samples were measured one week after artificial irradiation. TL emission at higher temperature also changed its shape during storage. We are successful to estimate apparent equivalent dose on foraminifera shells separated from marine sediment core, but we still continue examination especially on the stability of luminescence site and annual dose estimate of marine sediment.

We also observe TLCI from ostracods, which are good environmental index and direct age dating is also preferable. They too emit red luminescence, but their glow curve only show a peak at around 100°C not useful for estimate of accumulated dose. Unsuccessful measurement could be due to its small volume, or could be related to chemistry of ostracods.

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