

The SELFRAG Lab is a laboratory scale solution for the selective fragmentation of composite materials. The Lab uses high voltage electric discharges to fragment materials along grain boundaries, liberating individual components from the surrounding matrix. This study highlights the application of electric pulse fragmentation (EPF) in the recovery of intact microfossils.

## Recovery of intact foraminifera from indurated host rock by electric pulse fragmentaion

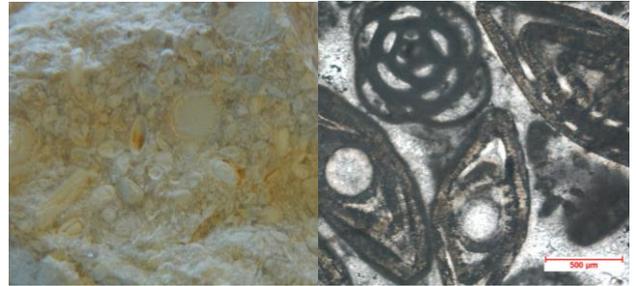
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### Purpose of Study

Foraminifera serve as useful palaeo-proxies for ocean chemistry composition and are used by palaeoclimatologists to interpret past climates, allowing predictions of future climate. Liberating these small, fragile microfossils from an indurated host matrix can prove impossible using traditional methods. Dissolution or cryogenic methods can take weeks to months with variable results and mechanical crushing can damage the specimens. This study aims to show the efficacy of EPF in the liberation of foraminifera from their host rock



Close up (left) and microscope image of sample 1

### Quality of treated product

The number of whole specimens outnumbered fractured specimens by a considerable margin, and forams in general had very little material attached to the outside - what remained could be easily removed with further processing. In general, the treatment was highly successful and will be of use when working with larger forams in highly lithified sediments as an alternative to thin section analysis alone.

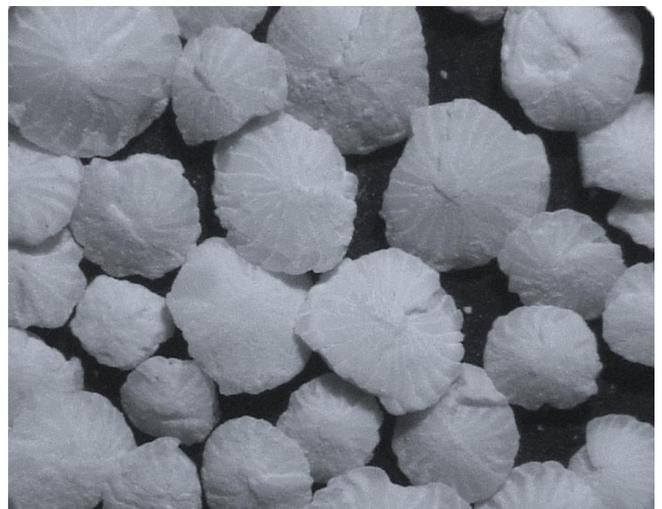


Jebel Hafeet sample 1

### Sample Treatment

A hand sample of bioclastic wackestone/packstone from Jebel Hafeet, Abu Dhabi, was treated in the Lab system using the open vessel with 10 mm aperture sieve. Machine settings are listed in the table below. Fifty discharges, or roughly ten seconds of processing was enough to fracture all material into particles below 10 mm in diameter and liberate microfossils.

Electrode Gap	Pulse rep. rate	Voltage	# discharges	Sieve diameter
30 mm	5Hz	160kV	50	10mm



Intact foraminifera recovered from sample 1 after processing. Field of view = 10 mm

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