

Publication

A portable low cost coulometric micro-titrator for the determination of alkalinity in lake and sediment porewaters

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Alkalinity is an important parameter in oceans, lakes, groundwaters and sediment porewaters as a link to the global carbon cycle. It is determined by classic titration with acid where sufficient sample volume is available. However, application to the limited amounts of sediment porewater requires a different approach. A portable low cost coulometric micro-titrator based on a RuO₂ pH-sensitive electrode and a Ag/AgCl reference electrode requiring 50 µl of total sample volume is presented. By using a distinct sandwich cell design, a well-defined titration volume could be achieved. The micro-titrator performed well within the targeted range of 1-10 mmol (L⁻¹) and a reproducibility within 3.5%. It was successfully applied to lake water and sediment porewater alkalinity measurements of Lake Lucerne and bears the potential for automation and in-situ applications.

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