
Renewable pencil electrodes for highly sensitive stripping potentiometric measurements of DNA and RNA

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Renewable graphite pencil electrodes are demonstrated to be excellent materials for adsorptive stripping measurements of trace nucleic acids. While displaying an attractive stripping performance, comparable to that of conventional carbon paste electrodes, the pencil electrode offers a convenient (mechanical) renewal, with each stripping potentiogram recorded at a fresh surface. Various pencil lead materials and lengths have been examined and experimental variables of the pretreatment and measurement procedures have been explored and optimized. The extremely low detection limits (e.g., $3 \mu\text{g l}^{-1}$ tRNA with 10 min accumulation) are coupled to a good surface-to-surface reproducibility (RSD of 6.4% for 14 repetitive measurements of 1 mg l^{-1} ssDNA).