

# Removal of palladium ions from aqueous systems by chemically modified cysteine carbon powder

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## Abstract

L-Cysteine methyl ester modified graphite powder (Cyscarbon) was used as a material to remove palladium ions from aqueous media. Cheap graphite powders (2-20  $\mu\text{m}$  in diameter) were surface functionalised with L-cysteine methyl ester. The removal of Pd(ii) ions was studied as a function of concentration of Pd(ii) ions, contact time with modified carbon and amount of modified carbon used. Determination of palladium ions was performed by adsorptive stripping voltammetry using a mercury nanodroplet array modified glassy carbon electrode. Dimethylglyoxime (DMG) was used as chelating agent for palladium. It was found that 1 g of Cyscarbon takes up 60  $\mu\text{M}$  palladium ions from 25 mL of 100  $\mu\text{M}$  palladium ion samples whilst the recovery experiment carried out by stirring the palladium-Cyscarbon with DMG gave a yield of 45% (optimised).

## Indexed keywords

**Engineering controlled terms:** Bioelectric phenomena; Carbon; Chelation; Concentration (process); Electrolysis; Esterification; Esters; Glass membrane electrodes; Graphite; Ions; Mercury (metal); Organic compounds; Palladium; Palladium compounds; Powders; Stripping (dyes); Voltammetry

**Engineering uncontrolled terms:** Adsorptive stripping voltammetry; Aqueous medium; Aqueous systems; Carbon powders; Chelating agents; Contact time; Dimethylglyoxime; Glassy carbon electrodes; Graphite powders; L-cysteine; Methyl esters; Nano droplets; Palladium ion

**Engineering main heading:** Nanostructured materials