

# Electrocatalytic reduction of nitrite on tetraruthenated metalloporphyrins/Nafion glassy carbon modified electrode

Calfumán, Karla

Aguirre, Maria Jesús

Cañete-Rosales, Paulina

Bollo, Soledad

Llusar, Rosa

Isaacs, Mauricio

This paper describes the electrochemical reduction of nitrite ion in neutral aqueous solution mediated by tetraruthenated metalloporphyrins (Co(II), Ni(II) and Zn(II)) electrostatically assembled onto a Nafion film previously adsorbed on glassy carbon or ITO electrodes. Scanning electron microscope (SEM-EDX) and transmission electron microscopy (TEM) results have shown that on ITO electrodes the macrocycles forms multiple layers with a disordered stacking orientation over the Nafion film occupying hydrophobic and hydrophilic sites in the polyelectrolyte. Atomic force microscopy (AFM) results demonstrated that the Nafion film is 35 nm thick and tetraruthenated metalloporphyrins layers 190 nm thick presenting a thin but compacted morphology. Scanning electrochemical microscopy (SECM) images shows that the Co(II) tetraruthenated porphyrins/Nf/GC modified electrode is more electrochemically active than their Ni and Zn analogues. These modified electrodes are able to reduce nitrite at -660