# Voltammetric reduction of 4-nitroimidazole derivatives: Influence of the N-1 substitution in protic and aprotic media

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The voltammetric reduction of 1-methyl- and 1-H- 4-nitroimidazole derivatives was studied in different protic and aprotic media to investigate the influence of the N-1 substitution in the mechanism of reduction, the susceptibility of the nitro group to reduction, and the stability of the nitro radical anion. The elucidation of their voltammetric behavior was carried out using differential pulse polarography and cyclic voltammetry with two different mixed media (Britton-Robinson/ethanol: 70/30 and DMF/citrate: 60/40) and an aprotic media (DMF) at the mercury electrode. In addition, we used UV-vis spectroscopy for the study of their chemistry in solution and quantum-chemical calculations to evaluate LUMO energies, HOMO and LUMO energy gaps, dipole moments and electron affinity, using water and DMF as solvents. The mechanism of reduction was strongly dependent on both the substitution at the N-1 position and the nature of the media. In all media, the methyl-substituted derivative (M-4-NIm