

# XXI Encontro Nacional SPQ

Química e Inovação

11 a 13 de Junho de 2008

Faculdade de Engenharia da Universidade do Porto





## ELECTROCHEMICAL EVALUATION OF THE REDOX-PROPERTIES OF DIARYLAMINES IN THE 2,3-DIMETHYLBENZO[b]THIOPHENE SERIES

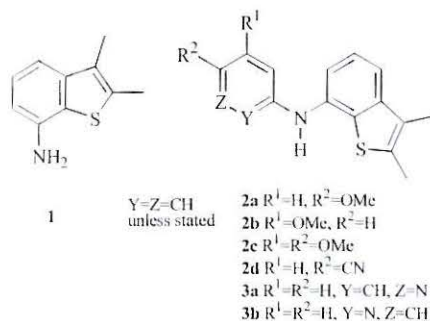
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The antioxidant properties of 7-aryl or 7-heteroaryl-amino-2,3-dimethylbenzo[b]thiophenes previously reported by us (1) make them very important as radical scavengers. Powerful electrochemical techniques such as cyclic voltammetry can provide a deeper insight into the redox-processes of oxidative stressors and antioxidants. The evaluation of the redox-properties of the synthesised compounds allows structure-activity relationship (SAR) studies, concerning the influence of different groups on the phenyl ring.



Cyclic voltammograms were recorded using an Autolab PGSTAT 302 with a typical three electrode cell. The electrochemical studies were performed in acetonitrile/TBAP, either with platinum or glassy carbon working electrodes. Voltammogram of compound **1**, collected at 1 Vs<sup>-1</sup> present three irreversible oxidation processes with E<sub>p/2</sub> at 0.81, 1.1 and 1.6 V, with a higher current density observed in glass carbon, as expected

for organic compounds due to adsorption phenomena. This redox behaviour is common to all other chemical species studied, although the anodic processes have different potential values due to the influence of the substituents in the phenyl ring: compounds with electron donor groups on the arylamine moiety, such as **2c**, have lower E<sub>p/2</sub> relative to compounds with electron withdrawing groups like **2d**. The position of the methoxy group on the arylamine fragment also changes the oxidation potential: lower E<sub>p/2</sub> for methoxy group in *para* position (**2a** vs **2b**). For heteroaryl-amino compounds the position of connection with the benzothiophene structure does not seem to influence significantly the redox properties (**3a** vs **3b**). Comparing the first peak potential with the patterns of synthetic antioxidants, BHA and BHT, diarylamine compounds show lower oxidation potential, and therefore higher reducing power.

*Acknowledgements:* Research Project POCI/QUI/59407/2004 (FCT-Portugal).

[1] Queiroz *et al.* *Bioorg. Med. Chem.* 15 (2007) 1788.