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Heterocyclic Schiff bases as non toxic antioxidants: Solvent effect, structure activity relationship and mechanism of action.

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Abstract

Phenolic heterocyclic imine based Schiff reagents from Thiophene-2-carboxaldehyde and Pyrrole-2-carboxaldehyde were synthesized and characterized as novel antioxidants. The solvent effects of these Schiff bases were determined and compared with standard antioxidants, BHA employing DPPH assay and ABTS assay. Fixed reaction time and Steady state measurement were used for study. IC_{50} and EC_{50} were calculated. Structure–activity relationship revealed that the electron donating group in the phenolic ring increases the activity where as the electron withdrawing moiety decreases the activity. The Schiff base derivatives showed antioxidant property by two different pathways namely SPLET and HAT mechanisms in DPPH assay. While in ABTS method, the reaction between ABTS radical and Schiff bases involves electron transfer followed by proton transfer (ET–PT) mechanism. The cytotoxicity of these compounds has been evaluated by MTT assay. The results showed that all these compounds are non toxic in nature.

Keywords: Schiff base; Antioxidant activity; DPPH; ABTS; Solvent effect; Structure activity relationship.

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