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PLASMACHEMICAL DISSOCIATION AND DEGRADATION OF NAPHTOL GREEN B COMPLEX

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Abstract

Exposure of a diluted solution of naphthol green B (50 mg L^{-1}) complex to non-thermal plasma in humid air induced a rapid dissociation of the complex after 5 min of treatment. This dissociation of the complex is not only due to the acidifying species created by the discharge but also to the oxidizing species. The main properties of non-equilibrium plasma processes at atmospheric pressure (gliding arc plasma) are related to the high values of the oxidation potentials of the reactive species. Organic ligand once released in solution is gradually degraded to approximately 50.66% after 30 min of treatment. The relevant controlling kinetics are first zero order (for up to 5 min, with $k_0 = 22.35 \text{ mgL}^{-1} \text{ min}^{-1}$) then pseudo-first order ($k_1 = 0.05 \text{ min}^{-1}$). This study established that exposing complex substrates to cold-plasma species can be used in recovering/recycling extraction solvents.

Key words: complexes, degradation, Naphthol green B, non-thermal plasma

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