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## SECONDARY MUNICIPAL EFFLUENT TREATMENT BY CATALYTIC WET HYDROGEN PEROXIDE OXIDATION

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### Abstract

Water recycling and reuse, answering the needs of creating cleaner water resources, need to be closely related with water resource management and technologies. Current municipal wastewater treatment plants are capable to control conventional pollutants (carbonaceous compounds, particulate matter, nutrients). Priority organic compounds, like polyaromatic hydrocarbons, polychlorinated biphenyls, endocrine disrupting chemicals, personal care products, pesticides etc., may escape the treatment and be released into the environment. Among the many technologies developed for the abatement of biologically recalcitrant pollutants, advanced oxidation treatments have distinguished as effective processes. Catalytic wet hydrogen peroxide oxidation (CWHPO) enables the use of an ecological agent,  $H_2O_2$ , and solid catalysts at mild conditions.

The main goal of this work was to evaluate the CWHPO of secondary municipal effluent in order to compare with other advanced treatment technologies used for wastewater recycling and reuse. Different catalysts based on AlFe pillared intercalated clays (PILCs) and iron/copper oxides containing mesoporous materials have been prepared for this purpose. The prepared catalysts were characterized by different methods as: ICP-OES, XRD,  $N_2$ -adsorption/desorption and TPR analysis.

The results of the catalytic tests for the secondary municipal effluent oxidation at mild conditions ( $pH=3.5$ ,  $T=30^\circ C$ , stoichiometric amount of oxidant) show that PILCs catalysts are more active in terms of TOC reduction and more stable against active species solubilization than SBA-15 supported samples.

*Key words:* CWHPO, municipal wastewater, pillared clays, SBA-15, wastewater recycling

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