conferenceseries.com SciTechnol

Expert Opin Environ Biol 2017, 6:4
DOI: 10.4172/2325-9655-C1-018

4th International Conference on
GREEN ENERGY & EXPO
&
6th International Conference on
RECYCLING: REDUCE, REUSE & RECYCLE November 06-08, 2017 | Las Vegas, USA

Sustainable treatment of industrial wastewaters with complex composition by recycling fly ash

Maria Visa
Transilvania University of Brasov, Romania

This work is focused on fly ash material with adsorption properties used for advanced wastewater treatment aiming at simultaneous removal of complex pollutant. There are gradually analyzed substrates containing fly ash (FA), modified fly ash by step-wise decreasing the alkali concentration down to 0.1 N alone or combined with natural adsorbents (bentonite, diatomite) and with photocatalysts (TiO_2, WO_3). Previous results were presented when using TiO_2-photocatalyst and FA and a comparative discussion is further developed in systems also containing WO_3. Removal of pollutants like dyes with a complex structure (azo-antrachinone, metal-complex dyes), heavy metals cations and surfactants from wastewater was investigated by adsorption and photodegradation onto a lot of substrates. The materials obtained from FA and WO_3, TiO_2, are used in removing pollutants from wastewater. Materials zeolite obtained from FA are an excellent adsorbent for heavy metals. New materials obtained from FA and surfactants as template were investigated for advance removal pollutants. The removal processes are investigated in dark (adsorption) and under UV illumination (adsorption+photocatalysis) in systems containing: (1) A single dye (Bemacid Blau; (2) One reactive dye or Bemacid Rot with Cu^{2+}; (3) Methylene Blue or Methyl Orange with Cu^{2+}, Cd^{2+} and mixtures of two dyes (BB+BR) and Cu^{2+}. Tests were done in batch experiments under stirring. The dye specific uptake by adsorption-photodegradation depends on the fly ash, the ratio FA-NaOH:TiO_2, FA-NaOH:WO_3, the dye type, the initial concentration of dye, the pH value in the system, the contact time and the mass of substrate. All these parameters are investigated and the optimized results are presented. The fly ash wide band gap semiconductor systems develop two simultaneous processes: Photodegradation and adsorption and the results are presented when treating wastewaters loaded with dyes, heavy metals, surfactants. The results show these combinations as a viable, low cost and up-scalable and sustainable technology.

maria.visa@unitbv.ro