

Past and Present Research Systems of Green Chemistry

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Uptake of organic pollutants by solid wastes as an eco-friendly remediation alternative

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The category of organic pollutants covers different groups of compounds: dyes, PAHs, pharmaceuticals, phenolic compounds, amongst others. The presence of phenolic compounds is often left aside in environmental remediation. However, the combination of their prevalence in industrial wastewaters and negative effects in human health and ecology is a top-priority concern. The US-EPA has already listed these compounds as pollutants of emerging concern. Chamomile (CM), green tea (GT) and peppermint (PM) spent tea leaves were used as alternative biosorbents of 2-chlorophenol (2-CP) from aqueous solutions in batch conditions at room temperature. Equilibrium parameters such as acidity and mass of biosorbents were studied to optimize the elimination of 2-CP. Likewise, the effect of interfering inorganic and organic species on the adsorption was studied. Experimental data indicate that the adsorption of 2-CP is strongly affected by the pH, displaying the maximum adsorption percentage at pH 9. Adsorption of 2-CP followed the trend: CM>PM>GT and was slightly affected by the presence of divalent lead and copper metal ions and polyethyleneglycol as ionic and covalent interfering species, respectively. According to the results, solid wastes such as these ligno-cellulosic materials have not only proven to be good adsorbent candidates, but also inexpensive and biodegradable materials.

Biography

Kateryna Zhdanova is a sophomore student at BMCC, majoring in Engineering Science. Originally from Ukraine, Kateryna envisions to master in Chemical Engineering with emphasis in Environmental Sciences. She has been working under the mentorship of Professor Navarro since this past January 2015 in the bioremediation of inorganic and organic pollutants from solutions. The authors would like to thank MSEIP and the Science Department at BMCC for the research facilities and financial support. This research was also conducted under the sponsorship of the UPR-RP Center for Renewable Energy and Sustainability and the HSI-STEM grant from the US Department of Education.

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