OMICS Group Conferences
Accelerating Scientific Discovery
4th World Congress on Biotechnology
September 23-25, 2013 Raleigh-North Carolina, USA

# Potential use of inexpensive green tealeaves for the bio removal of hair dyes

**Abel E. Navarro**

*City University of New York, USA*

## Abstract

Green tea is perhaps one of the most common and popular brewing teabags in our kitchens. Their chemical metabolites are precious for the treatment and prevention of some diseases. However, these leaves become a sanitation and disposal concern for larger scale industries that use teabags as raw materials. This study proposes the use of spent green tealeaves (GT) for the removal of hair dyes Basic Yellow 57 (BY57) and Basic Blue 99 (BB99). Dyes are underestimated pollutants that have impacts on humans and ecology. Equilibrium and kinetics studies were carried out in batch experiments. Our results show that adsorption of BY57 is optimized at pH 6 using 100mg of adsorbent in 50mL of a 85 mg/L solution. On the other hand, BB99 was better adsorbed at pH 5 with 75mg of GT of a 200mg/L dye solution. Salinity and presence of heavy metals experiments indicate a negative impact of these compounds on the adsorption. Isotherm theories of Langmuir, Freundlich, Dubinin-Radushkevich and Temkin were used to model the adsorption of both dyes on the adsorption, showing a good correlation. Kinetics experiments were also modeled and showed that less than 2 hours are needed to achieve the maximum adsorption. Finally, the physical and chemical properties of GT were elucidated using TGA, FTIR, SEM, and surface and porosity analyses, indicating its potential applicability for real conditions

## Biography

Abel E. Navarro received his Ph.D. degree in Biomolecular Chemistry at New York University. Now, as a Junior Faculty at BMCC, Prof. Navarro is developing new bioremediation alternatives for the elimination of pollutants from wastewaters. His work also includes chemical modification of adsorbents and production of different adsorption sites to improve the affinity between pollutants and adsorbents. Dr. Navarro has a publication record of more than 25 papers in specialized and peer-reviewed journals and has participated in several conferences. This study was done in collaboration with the Pontificia Universidad Católica del Perú and Universidad Peruana Cayetano Heredia under the project N° 001-2012-L´Oreal-CONCYTEC.