

8th European Chemistry Congress

June 21-23, 2018 | Paris, France

A novel X-Ray radiography approach for the characterization of fresh and exhausted granular activated carbons

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X-ray method proved to be reliable, accurate and sensitive technique to study activated carbons defining its exhausted level with organic compounds. For the first time, the characterization of the exhaustion level of granular activated carbon (GAC) used in rum production applied a method based on X-ray technology. Digital processing on X-ray radiography images from eight consecutive GAC layers of the industrial rum filter has been assessed. They were correlated with thermal desorption gas chromatography/ mass spectrometry (TD-GC/MS) chromatograms. The total of pixel detected in the radiographic X-ray images (grey-scale) is related with the total amount of organic adsorbed compounds in the exhausted GAC. The proposed method opens possibilities for the rum producers to improve the management and economical use of the activated carbon at industrial scale. This method is applicable to determine the saturation degree of all kinds of adsorbents used in the removal of organic compounds like dyes and pharmaceuticals in waste waters.

Biography

Jeamichel Puente Torres has completed his bachelor degree in biomedical engineering from Oriente University, faculty of electrical engineering in Santiago de Cuba province, Cuba in 2015. He occupied the position of Specialist "A" in electromedicine since 2016 and is in charge of department of biomedical metrology of the CNE (national center of electromedicine). He has studied 16 graduate degree courses and actually is working on two master's degrees (automatic control and energy efficiency) from Oriente University and his PhD in chemistry from Hasselt University supported by VLIR-UOS-P5 project and a BOF scholarship. He has recently published the work titled: A novel X-Ray radiography approach for the characterization of granular activated carbons used in rum production in journal of analytical science and technology 2018, 9:1.

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