

*Title:* **Analytical strategies for the control of organic pollutants in Drinking Water Treatment Plant using active carbon columns.**

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Nowadays, there is a global concern about the quality of water that reaches human consumption through the distribution network, due to the increase in human, agricultural and industrial activities that use products that can damage the environment. The drinking water treatment stations, through processes and technologies, manage to obtain quality water to be distributed to the population. These processes need to be controlled according to the RD/140/2003 of drinking water to ensure that the distribution water complies with the legislation ensuring a healthy water for human consumption. In the present research work, an analytical methodology for the control of organic contaminants in drinking water treatment plants was carried out. The method consists in the implementation of granulated activated carbon columns in the influent and effluent of drinking water treatment plants to evaluate both the pollution load to reach them from rivers and reservoirs, and the efficiency of the treatment processes applied to remove potential contaminants and supply drinking water of high quality for regular consumption. The study was carried out in two drinking water treatment plants located in the Mediterranean Sea, which supply water to areas with low-medium population density. To investigate the pollutants adsorbed into the activated carbon columns a solid-liquid extraction procedure was applied and the resulting extracts were fractionated for the monitoring and quantification of the analytes by gas chromatography coupled to mass spectrometry and flow injection analysis combined with high resolution mass spectrometry. Additionally, grab water samples were collected to dispose valuable information on the contamination load of the raw surface waters incoming to the treatment plants and to control the presence of volatile organic compounds in their effluents. All this work was done in order to assess the impact of these pollutants on the environment, propose measures to minimize their presence in water and evaluate the efficiency of the filtration process of different drinking water treatment plants.

**Keywords:** Drinking water, organic pollutants, water analysis, gas chromatography – mass spectrometry, disinfection by-products, environment, granular activated carbon (GAC).