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PM10 Chemical Characteristics in a Background Site at the Universidad Libre Bogotá

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Abstract : One of the most important factors for air pollution is that the concentrations of PM₁₀ maintain a constant trend, with the exception of some places where that frequently surpasses the allowed ranges established by Colombian legislation. The community that surrounds the Universidad Libre Bogotá is inhabited by a considerable number of students and workers, all of whom are possibly being exposed to PM₁₀ for long periods of time while on campus. Thus, the chemical characterization of PM₁₀ found in the ambient air at the Universidad Libre Bogotá was identified as a problem. A Hi-Vol sampler and EPA Test Method 5 were used to determine if the quality of air is adequate for the human respiratory system. Additionally, quartz fiber filters were utilized during sampling. Samples were taken three days a week during a dry period throughout the months of November and December 2015. The gravimetric analysis method was used to determine PM₁₀ concentrations. The chemical characterization includes non-conventional carcinogenic pollutants. Atomic absorption spectrophotometry (AAS) was used for the determination of metals and VOCs were analyzed using the FTIR (Fourier transform infrared spectroscopy) method. In this way, concentrations of PM₁₀, ranging from values of 13 µg/m³ to 66 µg/m³, were obtained; these values were below standard conditions. This evidence concludes that the PM₁₀ concentrations during an exposure period of 24 hours are lower than the values established by Colombian law, Resolution 610 of 2010; however, when comparing these with the limits set by the World Health Organization (WHO), these concentrations could possibly exceed permissible levels.

Keywords : air quality, atomic absorption spectrophotometry, gas chromatography, particulate matter
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