ENVIRONMENTAL APPLICATIONS OF PIXE AT THE ACCELERATOR FACILITY OF GHANA ATOMIC ENERGY COMMISSION

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Daily fine ($PM_{2.5}$) and coarse ($PM_{10-2.5}$) fractions of atmospheric particulate matter (APM) were collected at Adjankotey, a suburban community with a growing number of residential settlements and other socio-economic activities in the Ga-East district of Accra from September 2017 to May 2019 using the GENT air sampler [1]. After gravimetric analysis to determine the particulate mass concentration, the samples were analysed by EDXRF and Black Smoke Reflectometer methods; however, some measurements were carried out with proton induced X-ray emission (PIXE) technique [2] using the 1.7MV Pelletron Accelerator facility at the Ghana Atomic Energy Commissions. Both the monthly averages of mass concentrations and black carbon concentrations showed seasonal variations with higher levels recorded for the period of December to March which corresponds to the Harmattan season. The highest average elemental concentrations for coarse and fine particulates during the entire sampling campaign were recorded for major elements Al, Si, S, Cl, K, Ca, Mn and Fe. Data validation method of mass reconstruction and mass closure was used to determine temporal variations of chemical compositions of $PM_{2.5}$ and $PM_{10-2.5}$ fractions of APM sampled.