

## CHEMISTRY OF HARVESTED RAINWATER IN THE REFINERY AREA OF WARRI, NIGERIA BETWEEN NOVEMBER 2003 AND OCTOBER 2005

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### **Abstract :**

This paper assessed the chemistry of harvested rainwater collected over a period of two years (November 2003-October 2005) at the residential area close to the highly industrialized area of Warri Refinery and Petrochemical Company. The average number of rain events (NRE) was monitored throughout this period. The NRE during the rainy season was 218 times relative to that during the dry season (45 times). The direction of the South West Monsoon Wind and North East trade wind was linked to the seasonality of the number of rain events. Parameters as pH, turbidity, TDS, TSS, electrical conductivity, Cl<sup>-</sup>, SO<sub>4</sub><sup>2-</sup> and NO<sub>2</sub><sup>-</sup> were analysed. Mean values for Cl<sup>-</sup> (2.15mg/L), SO<sub>4</sub><sup>2-</sup> (0.945 mg/L) and NO<sub>2</sub><sup>-</sup> (18.33mg/L), were obtained during the dry season and that for rainy season were; pH (6.05), turbidity (36.25 NTU), TDS (1833.50 mg/L), TSS (20.70mg/L), electrical conductivity (227.50 ps/cm), Cl<sup>-</sup> (2.475-mg/L) SO<sub>4</sub><sup>2-</sup> (1.35 mg/L) and NO<sub>2</sub><sup>-</sup> (23.79 mg/L). Correlation of the seasonal variability was computed using the Pearson Product Moment. A weak positive correlation of  $r = 0.198, 0.400$  and  $0.108$  was observed for pH, TDS, and TSS respectively. Electrical conductivity showed a correlation of  $r = 0.434$ . A negative correlation of  $r = -0.530, -0.183, -0.641$  and  $-0.706$  was observed for turbidity, Cl<sup>-</sup>, SO<sub>4</sub><sup>2-</sup> and NO<sub>2</sub><sup>-</sup> respectively.

### 1.0 INTRODUCTION

In the past few decades, rainwater harvesting technologies have been extensively developed (Payero, 2002; Prinz and Woller, 1999; UNESCO, 1978 and Hutton, 1983). Rainwater harvesting is a method of collecting, storing and conserving rainwater from rooftops, land surfaces or rock catchments using simple techniques such as jars and pots as well as more complex technique such as underground check dams for future use (Critchley and Siegerl, 1991). It is a traditional water management technique (Prinz and Wolfer, 1999). This old technology is gaining new popularity these days especially in areas of prolonged periods of little or no rainfall or areas where public water works and distributing systems has completely broken down or areas where hydrogeological conditions does not favour the drilling of bore hole

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**Keywords:** rain events, seasonal variability, rain chemistry, chemical components.