**Title of Article:** Occurrence and Levels of Acetonitriles as Emerging Disinfection By-products in a Community Drinking Water Supply.

**Authors(s):** E. M. Shaibu-Imodagbe, C. A. Okuofu, A. Ismail, J. A. Otun, J. P Unyimadu, A. B. Williams and D. B. Adie


**Abstract:** Drinking water from Ahmadu Bello University (ABU) Zaria water treatment plant was sampled and analysed for haloacetonitriles (HANs) disinfection by products (DBPs) between 2008 and 2010. This was to determine the degree of wholesomeness of the drinking water supplied to the university community. On analyses, samples were found to positively contain dichloroacetonitriles, dibromoacetonitrile, and bromochloroacetonitrile among the commonly known haloacetronitriles in drinking water. They were detected at chlorination stage and sometimes in the house level water samples. Bromochloroacetonitrile mean concentration of 1.3927E-02±6.1033E-06 mg/L was detected in the chlorinated samples and was lost in samples from the distribution system most probably due to its hydrolysis in water. On the other hand, mean levels of dibromoacetonitrile and dichloroacetonitrile were observed to increase from 1.0605E-02±3.3349E-05 mg/L of and 1.36431E-03±1.4647E-06 mg/L, respectively, in the chlorinated sample to 2.4731E-02±5.2273E-04 mg/L and 2.2190E-03±1.8910E-06 mg/L in the house level water samples, respectively. This trend in mean concentration could be traceable to influence of increased acidity (decreased pH) and total organic carbon. These showed that the treated drinking water supplied to the university community was within the WHO, 2004 provisional guideline recommendations that individual haloacetonitrile could have concentration exceeding 0.01 mg/L. However, the distributed water contained higher levels than the generally assumed concentration of 0.002 mg/L (WHO, 2004). This has implication for increased glutathione (GSH) lipid peroxidation and covalent bond associated with haloacetonitrile related radioactivity to gut tissues resulting from scavenging reactive oxygen (ROS). Although not among the regulated DBPs, HANs presence in distributed drinking water could open up a new frontier of DBPs health risks. Hence, their levels need be monitored, their effects determined and adequately documented for regulation. Thus, would wholesome and potable drinking water (a human right) be guaranteed to the students, staff and their dependant family members of the ABU community.