

The relationship between environmental abundant electromagnetic fields and packaging shape to their effects on the keeping quality of drinking water

ABSTRACT

An investigation studying the effects of EMF shielding, storage duration and packaging shape on the quality of natural mineral drinking water has been completed. Two identical groups each consisted of four containers with different packaging shapes were manufactured. The containers were used to store natural mineral water for 30 days at ambient room temperature (25°C). One group was shielded by applying Faraday's shield. The surrounding electromagnetic fields were measured during the storage period by using TS-EMF portable measurement system. During the storage period, samples were collected for analysis at the end of one week, two weeks and one month. The relationship between the containers' packaging shape and the electromagnetic fields to their effects on the physicochemical and microbiological parameters of water were explored by electromagnetic (EM) simulation. The physicochemical parameters of the stored water remained within the permissible guidelines of the World Health Organization. It was observed that variations in the HPC of the water samples stored both shielded and unshielded containers during the storage period. There was no coliform count detected in the stored water in the three trials during the three phases of the study period. The EM simulation showed variations in the total SAR and maximum point SAR values, which is the energy absorbed by water at 2,400 MHz for both vertical and horizontal polarizations. It can be concluded that the variations in the values of SAR induced in water are directly related to the variations in the physicochemical and microbiological parameters of the stored water.

Keyword: Packaging shape; EM simulation; Water quality; Shape effect; Coliform