
Aluminum concentration in drinking water from Moldova territory, Romania

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Abstract Aims of this study were to quantify the levels of Al in tap water from Moldova territory and to compare the obtained value with Romanian Sanitary Norms. Al and other chemical parameters (calcium, magnesium, hardness, sodium, potassium, organic matter, chloride, nitrite, nitrate, microelements) have been determined in the finished drinking waters from Moldova territory (N=80) in 2005-2006 period. Aluminum was determined by molecular absorption spectrometry with Eriocrom Cyanine R (ECR) at a wavelength 535 nm. Method is based on the reaction between Al and ECR, which forms a red dye-lake at approximately pH=6.0. A linear calibration graph was obtained over the range 0.0 to 0.4 mg/L ($R^2=0.9984$, $n=7$). The used method gave recoveries from 99.93% to 101.66% for determination of 0.35-0.9 mg Al/L in tap water with satisfactory relative standard deviation values (<5%). Residual Al may vary significantly between different treated waters depending upon conditions, from about 0.003 mg/L to 0.2 mg/L or possibly higher. The obtained analytical data revealed that the Al concentration in drinking water ranged between 0.02 to 0.35 mg/L. 15.9% of all samples had residual concentration of aluminum greater than 0.2mg/L (maximum allowable concentration). The study demonstrates that there is necessary an appropriate drinking water treatment process control in order to ensure the optimum aluminum dose.

Keywords: aluminum, finished drinking water, molecular absorption spectrometry, Eriocrom Cyanine
