

Extraction-Photometric and Visual-Test Determination of Boron in Underground Local-Water of Oil and Gas Condensate Fields

E.A. Reshetnyak^{*†}, N.N. Nemets[‡], E.A. Shugaj[†], O.S. Chernyshova[§]

[†] V.N. Karazin National University, Svoboda Sq., 4, Kharkiv, 61022, Ukraine; *e-mail: reshetnyak@univer.kharkov.ua;

[‡] Ukraine Research Institute of Nature Gas "UkrNDIgaz", Gimnazicheskaya nab. 20, Kharkiv, 61010, Ukraine;

[§] State Scientific Institution "Institute of Single Crystals", Nauky Ave., 60, Kharkiv, 61072, Ukraine.

Received: February 12, 2018; Accepted: April 23, 2018

DOI: 10.17721/moca.2018.85-89

The photometric and visual-test method for boron determination in complex composition natural water, in which the dominant chemical form of boron is boric acid, was described. The determination is based on the chemical conversion of boron compounds to tetrafluoroborate at room temperature in the presence of sulfuric acid and sodium fluoride, and interaction of tetrafluoroborate ions with brilliant green with the following extraction of the obtained associate to benzene. In the sample preparation conditions no less than 95% of borates is converted to tetrafluoroborate. According to the calibration curve the limit of borates photometric determination (in terms of boron) is 0.024 mg/l. The limit of visual testing with the use of the comparison colour scale is 0.026 mg/l. For two methods the range of the determined content is (0.04-1.6) mg/l. The accuracy of the determination was proved by the "added-found" method.

Keywords: boron, underground water, tetrafluoroborate, brilliant green, extraction, benzene, photometry, visual colourimetry
