
DETERMINATION OF THE CONTENT OF HAFNIUM AND OXIDE HAFNIUM (IV) IN THE AIR OF THE WORK AREA

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The article describes the problem and the need to establish a hygienic standard for the mass concentration of hafnium and hafnium (IV) oxide in the air of the working area. It has been shown that in accordance with the requirements of the legislation of Ukraine, in order to obtain the permit for the production of products, substances that cause the hazard of an environment must be entered in the state register of hazardous factors. If such a standard for the air of the working area is absent, the permanent registration is impossible. Materials for the development of such a standard must necessarily include a measurement method for control of the content of the hazardous substance in the air of the working area, which provides a measurement in the range from 1/2 of the maximum permissible concentrations in the air of the working area (MPCw.a). MPCw.a for hafnium and hafnium (IV) oxide have not been determined.

The article is also devoted to the development of a technique for measuring of the mass concentration of hafnium and hafnium (IV) oxide in the air of the working area. The most widely known and used in the analytical chemistry the photometric method, which is characterized by high sensitivity, accuracy, and availability, was chosen as the basic one. The hydrofluoric acid was used to ensure complete and faster dissolution of hafnium and hafnium (IV) oxide. The effect of zirconium was taken into account by comparing the absorption of the complex with xylenol orange of an aliquot of hafnium sulfate solution with respect to the other part, to which Trilon B was added for masking of the hafnium ions. When developing and validating of the technique, the requirements has been observed of DSTU EN 482:2016 (EN 482:2012 + al:2015, IDT) "Work area air. General requirements for the characteristics of methods for measuring the content of chemicals" and the Law of Ukraine "On Metrology and Metrological Activity", entered into force on January 01, 2016. The methodology has passed scientific and methodological expertise in the State Enterprise "Committee on Hygienic Regulation".

Keywords: hafnium, oxide hafnium (IV), air of work area, aerosol, hazard class, MPC, photometry..

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