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COMPARING METHODS OF IMPURITY ANALYSIS IN NITROGEN TRIFLUORIDE AND TUNGSTEN HEXAFLUORIDE

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Fluorinated gases are significant in the modern electronics industry, particularly, in production of semiconductors and development of microelectronic devices. The most demanded inorganic gases in the microelectronic industry of the Russian Federation are nitrogen trifluoride (NF_3) and tungsten hexafluoride (WF_6). The main requirement of these gases is high product purity.

Nitrogen trifluoride is toxic gas, odorless and colourless, sustains combustion and shows oxidation behavior. Its specification is quality of 99.98 %. And it contains such impurities as CO_2 , CO , CF_4 , N_2 , N_2O , Ar , O_2 , SF_6 , hydrolyzable fluorides and HF . According to the requirements adopted by the International Gas Committee as SEMI-standards, the maximum permissible amount of impurities should not exceed 162 ppm.

Tungsten hexafluoride is colourless, odourless gas or clear liquid. Its specification is quality of 99.996%. It contains such impurities as O_2 and Ar , N_2 , CO_2 , CF_4 , HF , SiF_4 , SF_6 , CO . Also in WF_6 the metal content Al , Ca , Co , Cr , Cu , Fe , K , Mg , Mn , Mo , Na , Ni , Pb , Th , U , Zn should be controlled. The maximum permissible amount of impurities should not exceed 31 ppm.

The aim of this work is to review the methods for the analysis of the studied impurities and to choose the most effective one. Based on the SEMI-standard, gas chromatography and mass spectrometry should be used to analyse gas and metallic impurities respectively.

REFERENCE

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