

DIRECT DETERMINATION OF FLUORINE IN SOLID MATERIALS: A NON-TRIVIAL ANALYTICAL TASK

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One of the primary directions for the modern analytical scientists is the development of reliable and accessible methods, applicable for direct analysis of solids, including geological materials, crystals etc. Under increasing demand of high quality materials, they should be also controlled for such high ionisation energy elements, as fluorine. However, fluorine quantification in any water insoluble matrices poses a serious analytical challenge for both 'wet chemistry' techniques and direct methods because it is highly volatile and reactive. Conventional elemental techniques are additionally hampered by high ionization energy of the element (17.41 eV).

This study concerns analytical capabilities of pulsed glow discharge mass spectrometry for direct determination of fluorine in solid materials. Fluorine doped potassium titanyl phosphate crystals were considered as an example. Argon¹ and neon² discharges were investigated in means of their possibilities to provide effective ionization of fluorine. Direct mass spectrometric method for the sensitive determination of bulk content of fluorine and its spatial distribution in the crystal samples was developed^{1,2}.

References

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