

## Determination of Gold in Microelectronics Waste Pieces

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**Abstract :** Gold can be determined in natural objects and manufactured articles of different origin. The up-to-date status of research and problems of high gold level determination in alloys and manufactured articles are described in detail in the literature. No less important is the task of this metal determination in minerals, process products and waste pieces. The latter, as objects of gold content chemical analysis, are most hard-to-study for two reasons: Because of high requirements to accuracy of analysis results and because of difference in chemical and phase composition. As a rule, such objects are characterized by compound, variable and very often unknown matrix composition that leads to unpredictable and uncontrolled effect on accuracy and other analytical characteristics of analysis technique. In this paper, the methods for the determination of gold are described, using flame atomic-absorption spectrophotometry and gravimetric analysis technique. The techniques are aimed at gold determination in a solution for gold etching (KJ+J2), in the technological mixture formed after cleaning stainless steel members of vacuum-deposit installation with concentrated nitric and hydrochloric acids as well as in gold-containing powder resulted from liquid wastes reprocessing. Optimal conditions for sample preparation and analysis of liquid and solid waste specimens of compound and variable matrix composition were chosen. The boundaries of relative resultant error were determined for the methods within the range of gold mass concentration from 0.1 to 30g/dm<sup>3</sup> in the specimens of liquid wastes and mass fractions from 3 to 80% in the specimens of solid wastes.

**Keywords :** microelectronics waste pieces, gold, sample preparation, atomic-absorption spectrophotometry, gravimetric analysis technique

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