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ANALYTICAL REVIEW OF METHODS TO DETERMINE SULPHUR DIOXIDE IN AMBIENT AND WORKING ZONE AIR

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Sulphur dioxide (SO₂) can have harmful effects on human health and the environment being one of the principal air pollutants. Exposure of sulphur dioxide in higher maximum permissible concentrations (MPC) can significantly increase various respiratory diseases. The highest one-time MPC of SO₂ in the air of populated areas is 0,5 mg/m³, and in the air of the working zone is 10 mg/m³.

Sources such as small boiler stations with low-emitting chimneys, small plants in the local industry, and residential building chimneys as well as automobile engines are of considerable importance in urban ambient air pollution. The largest emitters of SO₂ are thermal power plants and metallurgical enterprises. In general, there may be several thousands of the sources in a modern city.

Currently, spectrophotometric, chromatographic, titrimetric and potentiometric methods of analysis are used to determine SO₂ in ambient and working zone air.

The purpose of the research is to study physical and chemical principles of the methods, to carry out a comparative analysis, and to choose the most optimal technique to measure mass concentrations of sulfur dioxide in ambient and working zone air.

The literature data analysis has revealed that the turbidimetric method is the most rapid and simplest. This method is based on oxidation of SO₂ during its capture from the air by absorbing solution followed by a turbidimetric determination of the precipitate formed from the reaction between sulfate ions and barium chloride.

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