Development of thermal desorption surface ionization spectroscopy method of analysis of sertraline and venlafaxine

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Introduction: In Uzbekistan, sertraline and venlafaxine acquired extraordinary importance in the drug monitoring, chemical-toxicological and forensic chemical examination. The reason for it is frequent incidents of acute and chronic poisoning by the representatives of these medicinal agents. The Aripov Institute of Electronics developed and made the indicator "Iskovich-I" for the detection and analysis of trace amounts of drugs and other abused medicinal preparations in users' urine, blood and cadaveric materials by means of the thermal desorption surface ionization spectroscopy method (TDSIS). The aim of the research is to develop the isolation method of sertraline and venlafaxine from biological material.

Methods: For detection of energizers by a method of thermal desorption surface ionization spectroscopy the analysis has been carried out in the following conditions: The emitter oxidized the molybdenum which has iridium in it; voltage of the emitter-405 V; emitter temperature-390-420°C, temperature of evaporation from 20 to 505°C; air stream-50 L/hour (voltage of the compressor 12 V).

Results: The thermal desorption range sertraline has characteristic peak at ~131±15ºС to ~190±15ºС (sensitivity 0.3 mkg/mL) and venlafaxine has characteristic peaks at ~110±15ºС to ~186±20ºС (sensitivity 0.5 mkg/mL). Also calibration curve for determination of the quantity of isolated from biological material was drawn. Sertraline in the case of a linear dynamic range of determination was 1.0-100 mkg/mL and venlafaxine10-200 mkg/mL.

Conclusions: The received spectra testify that by means of the TDSIS method of analysis it is possible to define authentically sertraline and venlafaxine in medicinal products and biological objects.

Ellagic acid ameliorates bleomycin induced lung toxicity in Wistar rats

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Bleomycin (BLM), widely used in cancer chemotherapy and lung toxicity, is a major deterrent in its clinical use. Ellagic acid (EA) is a good protective agent because it has rich antioxidant content. We wanted to study the prophylactic effect of EA on the toxicity profile of BLM. Wistar rats were exposed to BLM (10 mg/kg b.w., intratracheally) and EA (30 mg/kg b.w., orally) for 14 days of treatment schedule. Lung fibrosis was measured by checking the level of hydroxyproline which was supported by massive trichome analysis to check the level of fibrosis. Antioxidant profile and inflammatory markers were also measured in lung tissue as well as in bronchoalveolar lavage fluid (BALF). Study was supported by immunohistochemical examination of some pro-inflammatory proteins and apoptotic protein like NF-kB, iNOS, COX-2 and caspase-3 expression. In exposed animals, there was a significant increase in the level of hydroxyproline level. Various antioxidant enzyme activities such as glutathione peroxidase, glutathione reductase and superoxide dismutase were declined when exposed to BLM which was significantly restored by EA pretreatment. EA treatment modulates enhanced myloperoxidase, lactate dehydrogenase and alkaline phosphatase activity in lung tissue as well as in BALF. Treatment of EA caused significant decrease in lipid peroxidation level and increase in reduced-glutathione content. Massive trichome staining analysis strongly support the onset of pulmonary fibrosis and biochemical alterations showing changes such as inflammation and fibrosis in BLM treated lungs which was attenuated by EA. EA acid proved as a powerful protective agent against BLM induced acute lung toxicity.