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Photoionization sensor CES for non-invasive medical diagnostics¹ ALEKSANDR MUSTAFAEV², IULIIA RASTVOROVA, KRISTINA KHOBNYA, SOFIA PODENKO, Saint-Petersburg Mining University — Method CES (collisional electron spectroscopy), patented in Russia, the USA, Japan, China, Germany and Britain, allows to analyze the gaseous mixtures using electron spectroscopy under high pressures up to atmospheric without using vacuum. The design of VUV photoionization detector was developed based on this method. Such detector is used as a portable gas analyzer for continuous personal bio-medical monitoring. This detector measures energy of electrons produced in ionization with resonance photons, whose wavelength situated in the vacuum ultraviolet (VUV). Nowadays, micro plasma source of such photons on resonant line of Kr with energy of 10,6 eV is developed. Only impurities are ionized and detected by the VUV-emission, meanwhile the main components of air stay neutral that reduces background signal and increases the sensibility along with accuracy. The experimental facilities with VUV photoionization sensors CES are constructed with the overall sizes about 10*10*1mm. The watt consumption may comprise less than 1W. Increase of electrometer amplifier's sensibility and more high-aperture construction are used today to increase the sensibility of CES-detectors. The wide range of detectable molecules and high sensitivity allow the development of portable device, which can become the base of the future preventive medicine.

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