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VUV-Photoionization CES-Detector of Volatile Bio-Marker Molecules ALEXANDER MUSTAFAEV, National Mineral Resources University, St.-Petersburg, Russia, NATALIYA LUNEVA, St.-Petersburg State University, Faculty of Dentistry and Medical Technologies, Russia, GEORGE PANASYUK, UES Inc., Dayton OH 45432, USA, NIKOLAY TIMOFEEV, St.-Petersburg State University, Faculty of Physics, Russia, ALEXANDER TSYGANOV, Spectrum-Micro LLC, St.-Petersburg, 191036 Russia — Energy spectra of characteristic electrons released via photoionization by vacuum ultraviolet (VUV) radiation of admixture molecules in the atmospheric air, not using traditional evacuated energy analyzers, can be determined by Collisional Electron Spectroscopy (CES) method [1]. Some details of CES-photoionization sensor were described in [2]. Our further developments are devoted to application of CES-detectors for a mobile continuous bio-chemical diagnostics. It is known that "on breathing" it is possible to find out volatile bio-marker molecules of a lot of diseases (lung cancer, tuberculosis, COPD, asthma, diabetes, kidney disease, mammary cancer, Crohn's disease, ulcerative colitis, etc). But today's weighty and expensive laboratory equipment (like GC MS) provides observation of these bio-markers only during patients' visits to a doctor. In this way we study pocket-size CES-sensor with micro-plasma krypton resonance radiation source (10.6 eV photons) for the photoionization detection of metabolic ammonia, ethanol, acetone and pentane molecules directly in atmospheric air.

[1] A.A. Kudryavtsev, A.B.Tsyganov. US Patent 7,309,992.
[2] G.Y.Panasyuk, A.B. Tsyganov. Journal of Applied Physics, 2012, v.111, p.114503

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