

Determination of mercury amount received by a person in inhalation

S. Pogarev¹; V. Ryzhov¹, N. Mashyanov¹, S. Sholupov², J Siperstein³

1Earth Crust Rsch. Inst., Petersburg State Univ., St. Petersburg, Russia

2 Lumex Ltd, St. Petersburg, Russia

3 OhioLumex Co, Inc., USA

Power plants are one of the main anthropogenic sources of mercury emission in the atmosphere. More than 70% of mercury is released in the atmosphere as elemental mercury (Hg^0). Resident time of mercury (Hg^0) in the atmosphere is about one year. It is established that about 80 % of Hg^0 , inhaled by a person, remains in the body and it deposits in various internal organs including the brain. Since mercury is a reason of various mental diseases, particularly, of autism, it is clear that there is interest in different methods of determination of mercury received by a person through inhalation.

A new rapid technique of determination of inhalation dose based on direct measurement of the mercury concentration in the exhaled air by application of the Zeeman mercury spectrometer RA-915+ is proposed. It is experimentally proven that the dose value in short-time exposure to mercury vapors is most faithfully determined by the above method and not by conventional techniques based on the mercury content in blood or urine. The developed technique allows for rapid and reliable determination of received doses of mercury being that are greater than 1 μg .