



Contribution ID: 434

Type: **Verbal**

TRLIF and TRLIC Laser Spectroscopy and Detection of Actinides/Lanthanides in Solutions

Thursday, 17 May 2018 11:45 (15 minutes)

This work is devoted to applications of the time-resolved laser-induced luminescence (TRLIF) spectroscopy and time-resolved laser-induced chemiluminescence (TRLIC) spectroscopy for detection of lanthanides and actinides. Pu, Np, and some U compounds do not produce direct luminescence in solutions, but when excited by laser radiation, they can induce chemiluminescence [1-4] of chemiluminogen (luminol in our experiments). It is shown that multi-photon scheme of chemiluminescence excitation makes chemiluminescence (TRLIC) not only a highly sensitive but also a highly selective tool for the detection of lanthanides/actinides. Results of the experiments on Eu, Sm, U, Pu, and Np detection in different solutions are presented.

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Session Classification: NAM 4

Track Classification: Nuclear Analytical Methods