

**Scientific advisor's reference on the Master thesis of
Fomin Andrey Dmitrievich, the second year master student at the Department of Laser
Chemistry and Laser Materials Science of St. Petersburg State University,
“Laser-induced synthesis and investigation of physical and chemical properties of non-
enzymatic microsensors composed of iridium-bearing materials”**

Fomin Andrey Dmitrievich has carried out the research for his Master thesis at the Department of Laser Chemistry and Laser Materials Science of St. Petersburg State University. Andrey's work considered a relevant topic – the development of non-enzymatic microsensors for the detection of glucose and other disease markers in human blood samples. As a result, Fomin A.D. has succeeded in obtaining gold, iridium, and platinum microcomposite materials that demonstrated very high sensitivity. To obtain these materials, the method of laser-induced metal decomposition from solution was applied. This method has been successfully applied for solving this kind of problems previously. Andrey showed that doping iridium microstructures with gold and platinum sufficiently increases the quality of their surface morphology and significantly enhances their electrocatalytic activity compared to non-enzymatic glucose detection methods. The obtained results are of great importance for practical applications and should be published in international scientific journals. It is worth mentioning that Fomin A.D. demonstrated himself as a researcher who can solve the assigned tasks on his own. However, several important remarks should be mentioned. The choice of glucose as the analyte is not explained in the literature review of his Master thesis. In the Methods section the description of the methods for electrochemical measurements should be more extensive. In the Results section no quantitative evaluation of the surface topology of the synthesized microstructures is presented, also there are no assumptions on the possible catalytic reactions of glucose oxidation on the surface of the microelectrodes. The abovementioned remarks decrease the quality of Andrey's thesis. In general, the Master thesis of Fomin A.D. has scientific novelty, the selected topic is relevant, the obtained results can be used in practice. The work should be graded as 'good'.

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