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Optical Emission Spectroscopy of Microplasma Discharge in Sea Water[1] VLADISLAV GAMALEEV, AKIMITSU HATTA, HIROSHI FURUTA, JUN-SEOK OH, YO OKAMURA, KENSUKE KITAMURA, YUSUKE HASHIMOTO, Kochi University of Technology — We have been investigating microplasma discharge in sea water for optical emission spectroscopy. Microplasma discharge in artificial sea water (10ASW) was carried using needle-to-plane platinum electrode system. The gap, between electrodes, was ranged from 10 to 60 microns. The electricity source was impulse generatorwith MOSFET switch and variable capacitance and inductance. The maximum voltage and current for this scheme were respectively 1kV and 10A, pulse width 10 μs. It has been confirmed that, using the micro-gap configuration, spark discharges were ignited at the conventional breakdown voltages below 1kV, even in the conductive sea water. Was noted formation of small bubbles before of the plasma ignition process. The mechanism of formation of these bubbles is mostly Joule heating because of high currents. It has been speculated that plasma discharge initiates in bubbles. Optical emission spectroscopy of microplasma in sea water was carried. In the spectra, emission peaks for H, O, Na, Mg, Ca, Cl and Pt were clearly detected. Besides the main components of 10ASW, contaminants from the electrodes appeared in the spectra. The characteristics of microplasma discharge in sea water and analysis of the optical emission spectra will be presented.

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Vladislav Gamaleev
Kochi University of Technology

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