

Bio-image Sensor for real-time pH and optical imaging

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In studying cells and living tissues, the development of a bio-imaging technology for direct observation of the distribution and localization of physiologically active substances is desired. In this study, we propose a bio-image sensor that has the features of both pH (power of Hydrogen) and optical measurements. The promising feature of a bio-image sensor is that one pixel is able to acquire a number of different physical values, such as pH and light intensity, without mixed mounting of the sensors. The sensor architecture is based on the charge-transfer-type pH sensor by adapting the charge coupled device technology. Measurements of the characteristics of the devised bio-image sensor were then carried out. To evaluate the device performance, the pH signal was obtained using five standard buffered solutions and optical signal was applied using light emitting diodes. The measurement results show a linear increase in the output voltage with the irradiated light intensity. Moreover, the pH measurement showed a pH sensitivity of 37 mV/pH. Final results show the effectiveness of the devised bio-image sensor to biochemical and optical analyses ^[1,2].

Biography

Hirokazu Nakazawa was born in Aichi, Japan in 1984. He received his B.A. and M.S. degrees in Electrical and Electronic Engineering from Toyohashi University of Technology, Aichi, Japan in 2008 and 2010, respectively. He is currently pursuing his Ph.D. at the same university and is a Research Fellow of the Japan Society for the Promotion of Science (JSPS). His research topic during his graduate studies was a multimodal bio-imaging sensor with a filterless fluorescence detection function.

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