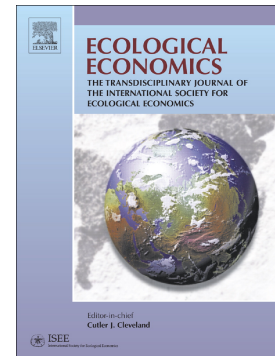


## Accepted Manuscript

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PII: S1388-2481(17)30029-2  
DOI: doi: [10.1016/j.elecom.2017.01.020](https://doi.org/10.1016/j.elecom.2017.01.020)  
Reference: ELECOM 5869  
To appear in: *Electrochemistry Communications*  
Received date: 1 January 2017  
Revised date: 27 January 2017  
Accepted date: 27 January 2017

Please cite this article as: Toshiro Yamanaka, Hiroe Nakagawa, Shigetaka Tsubouchi, Yasuhiro Domi, Takayuki Doi, Takeshi Abe, Zempachi Ogumi , In situ Raman spectroscopic studies on concentration change of ions in the electrolyte solution in separator regions in a lithium ion battery by using multi-microprobes. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Elecom(2017), doi: [10.1016/j.elecom.2017.01.020](https://doi.org/10.1016/j.elecom.2017.01.020)

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In situ Raman spectroscopic studies on concentration change of ions in the electrolyte solution in separator regions in a lithium ion battery by using multi-microprobes

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Abstract

Changes in the concentration of ions in the electrolyte solution between electrodes in a lithium ion battery were studied by in situ multi-microprobe Raman spectroscopy. The distance between the two electrodes was set to 190  $\mu\text{m}$ . Six separator films, each with a thickness of 25  $\mu\text{m}$ , were inserted between the two electrodes, and probes were inserted between the separator films at the anode side, the middle position and the cathode side. After repeated charge/discharge cycles, the concentration of ions increased and decreased during charging and discharging, respectively. Such concentration changes first started to occur at the anode side and then occurred at the middle position and finally at the cathode side. The results suggest complexity of changes in the concentration of ions in separator films with micropores in practical batteries.

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