

Estimation of chemical properties of lake water at Lakes Nyos and Monoun using sound velocity profiles and transparency

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Limnic eruptions in 1984 and 1986 at Lakes Monoun and Nyos in Cameroon were caused by sudden degassing of magmatic CO₂ dissolved in the lake water. The disasters killed about 1800 residents around the lakes. To prevent further disasters, monitoring of CO₂ in the lake waters is essential. For frequent measurement, we developed a convenient method of CO₂ monitoring using sound velocity (SV) as part of SATREPS project supported by JICA and JST. In the 2014 survey, we took movies of the under-water and the bottom of the lakes using an underwater camera with a pressure container of 200 m resist. The vertical change of transparency of water was observed by checking the visibility of reflectors set in front of the camera. A pressure sensor simultaneously monitored the depth. The thickness of the cloudy water layer with suspending substance was 6~7 m at the surface of Lake Nyos and the transparency of water becomes clearer with depth. At Lake Monoun the transparency of water increases with depth near the surface, but decreases again with depth around the bottom. At the the deep part of Lake Monoun, there seems to be a negative correlation between transparency and CO₂ concentration, but at the deep part of Nyos the transparency does not decrease with the increase of CO₂ concentration. It may be caused by the difference of ion species between two lakes. We will survey again at Lake Nyos on March 2015. The results of the 2015 survey will be also presented at the meeting.

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