

Distribution of marine clay layers and spontaneous potential in Ayumino, Izumi City

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1. Introduction

The sulfide minerals, included in the marine clay layers, form the ore body battery with oxidation reduction phenomenon. This process often causes the generation of the high potential difference (RYOKI, 1990). RYOKI(1999) and RYOKI(2000) showed that the distribution of the marine clay layer was able to be clarified by measuring potential in the ground surface. Continuously to these in this time, the investigation was done in the marine clay layer distribution region where the creation development was newly to know the relation between distribution and the potential malfunction in the marine clay layer.

2. Investigation area

The potential measurement was done along the main road in the area of about 1.5km x 0.7km of Ayumino, Izumi City, Osaka Pref. The number of measurement station was 129. It is assumed that the Ma3 layer is chiefly distributed in the region where potential was measured according to Kansai geotechnical consultants association (1998).

3. Method

A couple of Pb-PbCl₂ Chloride non-polarization electrodes(RYOKI et al., 2001) was grounded to surface spacing of 50m, and the potentiometry measured between these electrodes with a digital tester. Two electrodes were alternately moved. Afterwards, the potential difference between the various place points was multiplied one by one. This value was potential at the positive electrode position to the reference point that was negative electrode position of began the measurement. The measurement did on the 20th and 27th December, 2002. The measurement route was set to a closed-loop every day or half a day.

An artificial modification of geographical features advances toward the investigation region because of development on the way. However, because a lot of excellent outcrops were seen fortunately, a part of distribution of the marine clay layer was investigated again.

4. Result and consideration

When the measurement results are compared with the distribution of the marine clay layers, it is understood that the low potential anomalies well correspond to the marine clay layers. On the other hand, when the measurement results are compared with geographical features, it is thought that local distribution of low potential does not depend on geographical features in the investigation area.

In general, when the spontaneous-potential is measured around the sulfide deposit which has been buried underground, it is known that negative potential compared with surroundings is distributed on the deposit. The sulfide, 0.38-1.72 percent by weight as an amount of all S, is included in the marine clay(ITIHARA and ITIHARA 1971). And it is thought that the low potential anomaly compared with surroundings is shown in a comparatively new outcrop because the ore body battery process is caused.

Therefore, it is confirmed at this time that the low potential anomalies exist by the ore body battery process in the marine clay layer just like the report before.

Reference

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