



Self-potential variation associated with carbon dioxide storage

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Accelerating of global warming is caused by increasing emissions of greenhouse gases such as carbon dioxide. Reduction approaches of the greenhouse gases is one of the urgent problems on a global scale and attempted in many countries. Carbon dioxide capture and storage is an economical and efficient technology to the reduce greenhouse gas emissions. However, monitoring method of injected and storage carbon dioxide is now developing. Self-potential is caused by the electrokinetic phenomenon of streaming potential, which has been applied to investigation of subsurface fluid flow. In this study, we demonstrate self-potential monitoring with carbon dioxide storage at the Ogachi test field in Japan and calculating of the self-potential changes using 3D simulation code (STAR + EKP post-processor, e.g. Ishido and Pritchett, 1999). The observed self-potential change is very small, however, significant self-potential anomaly is located at the center of the injected well. 3D simulation of the self-potential predicts the same scale of the observed anomaly. These results suggest that self-potential method is useful for the monitoring of carbon dioxide storage.