

Carbon Capture and Storage (CCS), Evaluation of Carbon Dioxide Storage Efficiency at the Western Siberia Field.

*Pavel Golub*¹, *Andrei Cheban*², and *Evgenii Romanov*³

¹Coretest Service, Deputy Chief Centre, 2a Lenina st., Russia

²Coretest Service, Head of the Laboratory, 2a Lenina st., Russia

³Coretest Service, General Director, 2a Lenina st., Russia

Abstract. Measures need to be taken to reduce the amount of carbon dioxide (CO₂) in the atmosphere due to climate change around the world. Storing CO₂ allows for more efficient carbon management practices. To date, the improvement of technologies for partial replacement of the buffer volume of gas in underground gas storages (UGS) with CO₂ and its disposal in a porous medium is an urgent task. Also, partial replacement of buffer gas by CO₂ will allow decreasing capital costs for UGS by means of the buffer gas volume decrease. The geological properties of UGS facilities determine the reliability of CO₂ capture and storage. The laboratory research stage is a fundamental component of the introduction of technologies. In the article, experiments were carried out on the injection of liquid CO₂ into a porous medium, and the processes occurring in the reservoir during the injection and storage of CO₂ were studied. The effect of liquid CO₂ on the mineral composition and reservoir properties of core samples was evaluated. The complex of filtration studies consisted of experiments on single-core samples of the target reservoir bed. The assessment of the impact of liquid CO₂ injection and holding at 7 days was carried out on core samples with residual water saturation in reservoir conditions. The article presents an analysis of the effect of liquid CO₂ on the mineral and reservoir properties of the core. On the basis of the research carried out, technical solutions were obtained for the efficient use of UGS facilities for CO₂ storage in Western Siberia.