

## Introduction

Ukraine doesn't play key role in carbon sequestration projects in Europe, but never the less a number of researches were carried out lately. One of the regions, considered to be perspective is Volyn-Podillia. Located in the western part of Ukraine, it was one of the goals for petroleum exploration. But neither oil nor gas fields were discovered, and nowadays it is believed that those plays can be potential target for deep earth storage projects in general, but primary for carbon sequestration.

The goal for this study was to investigate petrophysical parameters of reservoir rocks at the potential site and to model the changes of these parameters with pressure.

## Methodology

The research was made at the high-pressure system (HPS) that allows modeling petrophysical parameters, such as porosity or velocity of the elastic waves at the conditions, close to the in-situ conditions of the reservoir.

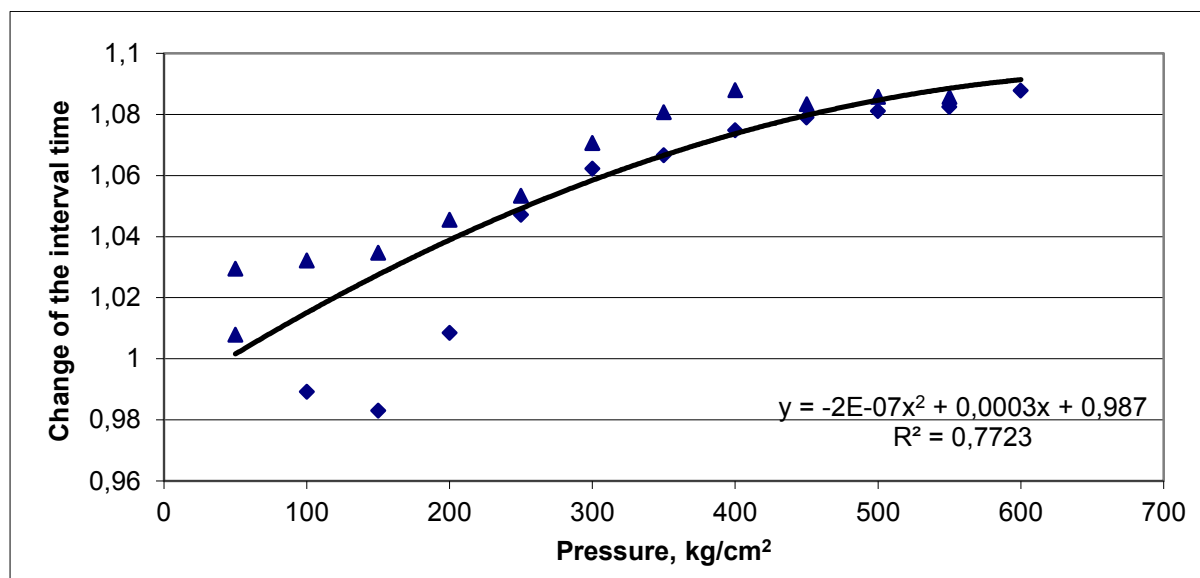
Before studying samples at the HPS, we use standard methodology to determine petrophysical parameters of the core:

- Samples are cleansed from residues of oil and salts by extraction in chloroform solution and alcohol-benzene blend.
- Samples are dried.
- Petrophysical parameters are determined at atmospheric conditions.

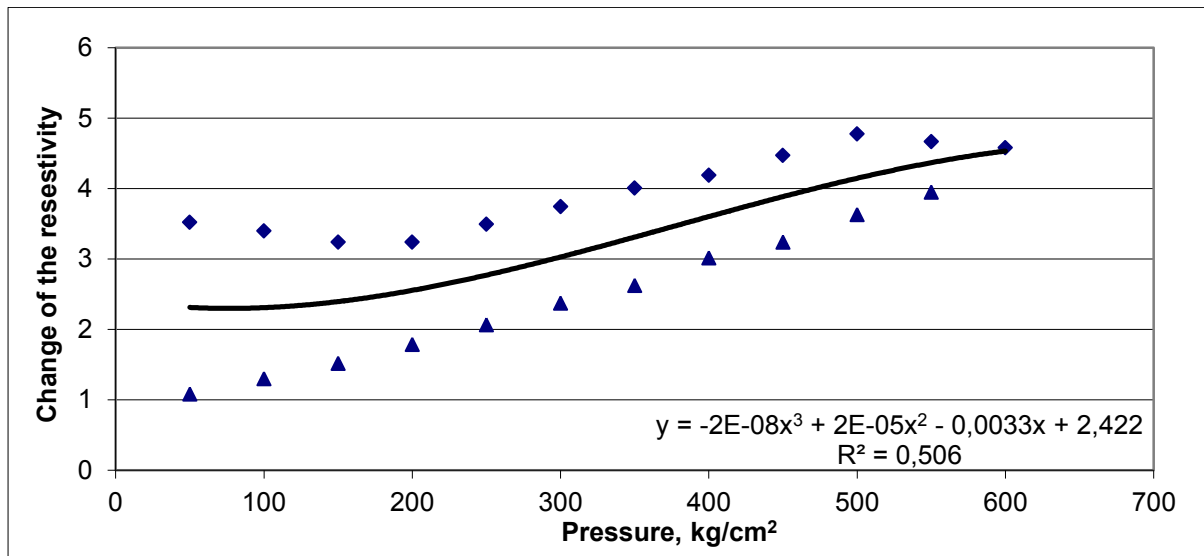
After studying core samples at atmospheric conditions a group of samples are examined at the conditions close to in-situ conditions – porosity, resistivity and velocity of elastic waves are measured at pressures from 0 to 98 MPa.

## Results

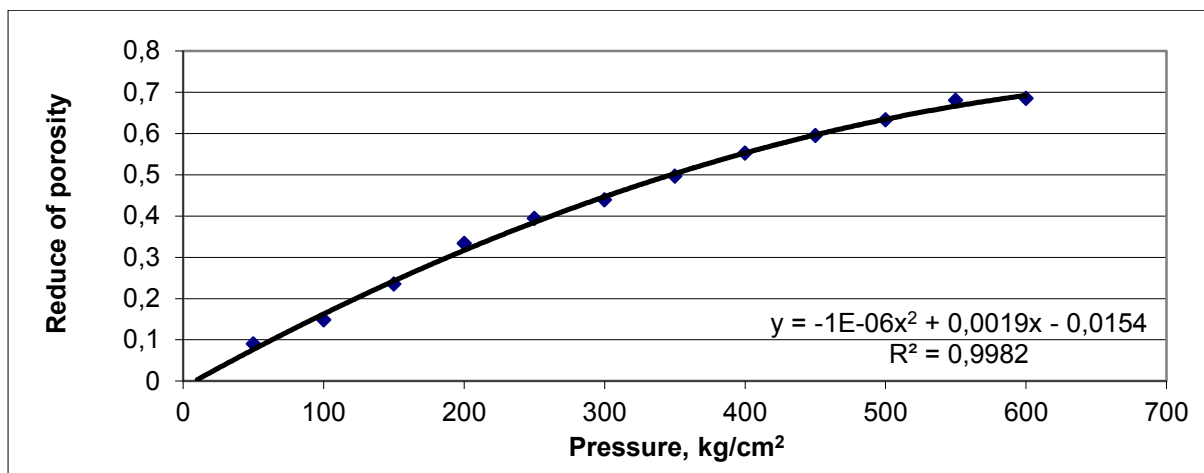
Before measures samples are mineralized with the solution close to the reservoir one. Afterwards, calculating amount of the displaced water we can estimate relative reduce in porosity of the samples.



**Figure 1** Change of the interval time with pressure. Triangles are forward trace, lozenges– reverse.



**Figure 2** Change of the resistivity with pressure. Triangles are forward trace, lozenges– reverse.



**Figure 3** Reduce in porosity with pressure

## Conclusions

The changes of petrophysical parameters of the reservoir rock core samples of the Volyn-Podillia petroleum area depending on pressures are studied. Relationships of the changes of porosity, interval time and resistivity are calculated, which allows building petrophysical relationships for more precise well log interpretation and formation evaluation of the targeted intervals.

## References

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- Krupsky, Yu. Z., [2001] *Geodynamical conditions of forming and oil-and-gas bearing of the Carpathians and Volyn-Podil regions of Ukraine*. Kyiv