Karol Skowera
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FUSION OF DIFFERENTIAL ANALYSIS OF VOLUMETRIC STRAIN METHOD (DILATOMETRIC THERMOPOROMETRY) AND MERCURY INTRUSION POROSIMETRY METHOD FOR PORE SPACE CHARACTERIZATION IN CARBONATE ROCKS

POŁĄCZENIE METODY RÓŻNICOWEJ ANALIZY ODKSZTAŁCEŃ ORAZ METODY POROZYMETRII RTĘCIOWEJ DO OKREŚLENIA CHARAKTERYSTYKI PRZESTRZENI POROWEJ W SKAŁACH WĘGLANOWYCH

Karol Skowera*
Kielce University of Technology

A b s t r a c t

Many characteristics of capillary-porous materials, including limestones and dolomites, depend on the structure of the pore space of a given material, so the article attempts to accurately determine the geometric characteristics of pores and their ability to transport water. Much information on the pore structure of carbonate rocks can be obtained from literature studies. There is a lack of information on the use of full hysteresis dilatometric thermoporometry methods for this purpose, as well as the fusion of differential analysis of volumetric strain (DAVS) results with mercury intrusion porosimetry (MIP) results.

The subject of the research presented in this article is the analysis of pore structure in carbonate rocks using the method of differential analysis of volumetric strain and mercury intrusion porosimetry. Based on the measurements made, the pore size, pore volume, content of empty pores and pores containing water incapable of phase transformation were analyzed. The geometry of mesopores of rock samples examined by differential analysis of volumetric strain and mercury intrusion porosimetry was compared. A fusion of the distribution of mesopores from the DAVS study with a part of the distribution of meso- and macropores obtained by the MIP study was performer.

Keywords: differential analysis of volumetric strain method, mercury intrusion porosimetry, carbonate rocks, pore space

S t r e s z c z e n i e

Wiele cech materiałów kapilarno-porowatych, w tym wapieni i dolomitów, zależy od struktury przestrzeni porowej danego materiału, dlatego w artykule podjęto próbę dokładnego określenia cech geometrycznych porów i ich zdolności do transportu wody. Wiele informacji na temat struktury porów skał węglanowych można uzyskać ze studiów literaturowych. Brakuje informacji na temat wykorzystania w tym celu metod termoporometrii dylatometrycznej z pełną histerezą, a także połączenia wyników różnicowej analizy odkształceń (DAVS) z wynikami porozymetrii rtęciowej (MIP).

Przedmiotem badań przedstawionych w niniejszym artykule jest analiza struktury porów w skałach węglanowych z wykorzystaniem metody różnicowej analizy odkształceń i porozymetrii rtęciowej. Na podstawie przeprowadzonych pomiarów przeanalizowano wielkość porów, objętość porów, zawartość porów pustych oraz porów zawierających wodę niezdolną do

*Kielce University of Technology, Poland, e-mail: kskowera@tu.kielce.pl

przemiany fazowej. Porównano geometrię mezoporów próbek skalnych badanych metodą różnicowej analizy odkształceń i porozymetrii rtęciowej. Wykonano fuzję rozkładu mezoporów z badania DAVS z częścią rozkładu mezo- i makroporów uzyskanych w badaniu MIP.

Słowa kluczowe: różnicowa analiza odkształceń, porozymetria rtęciowa, skały węglanowe, przestrzeń porowa

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