



Permeation analysis in porous rocks based on a photoacoustic system

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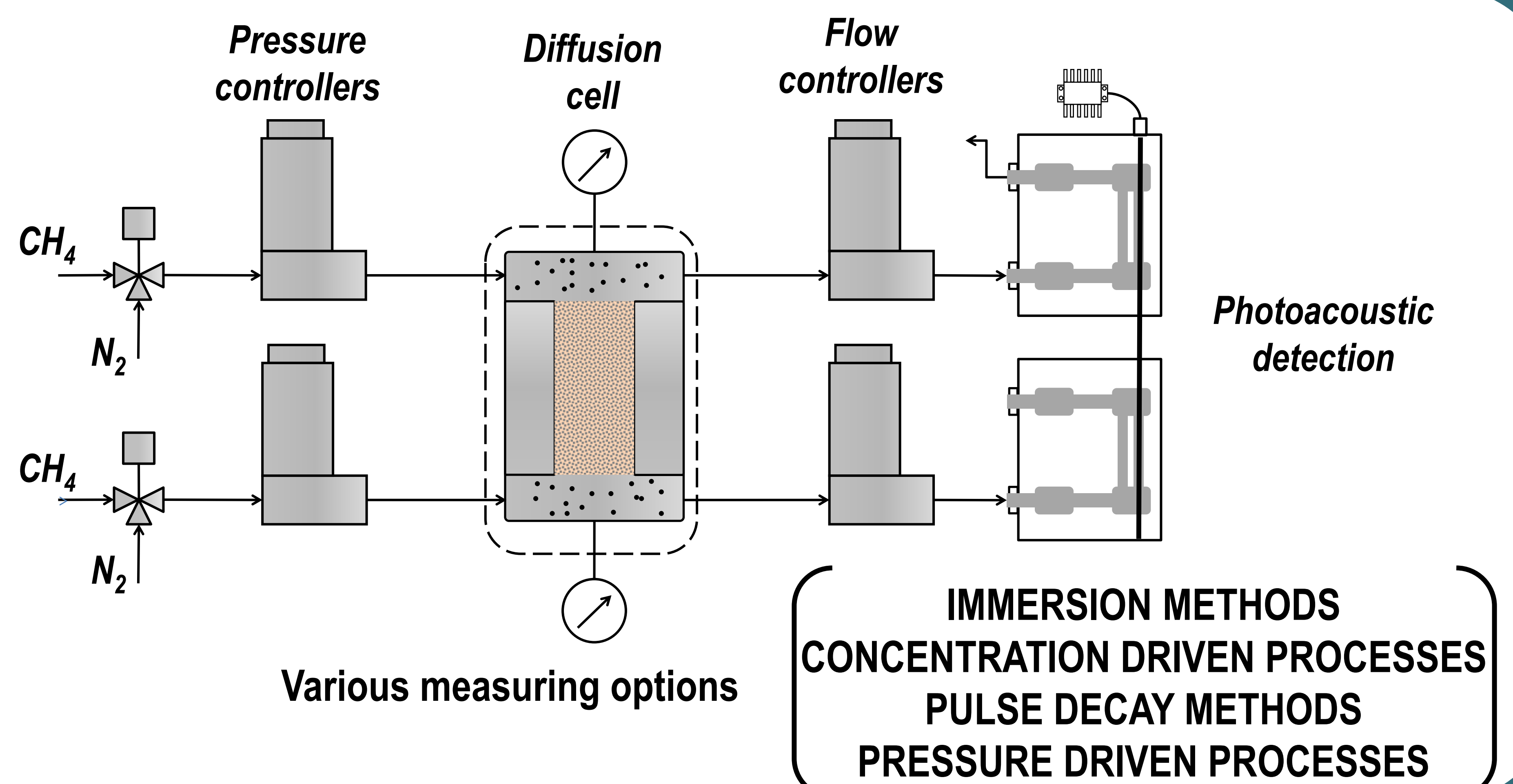
^b Hilase Ltd. 8000 Székesfehérvár Berényi út 72-100



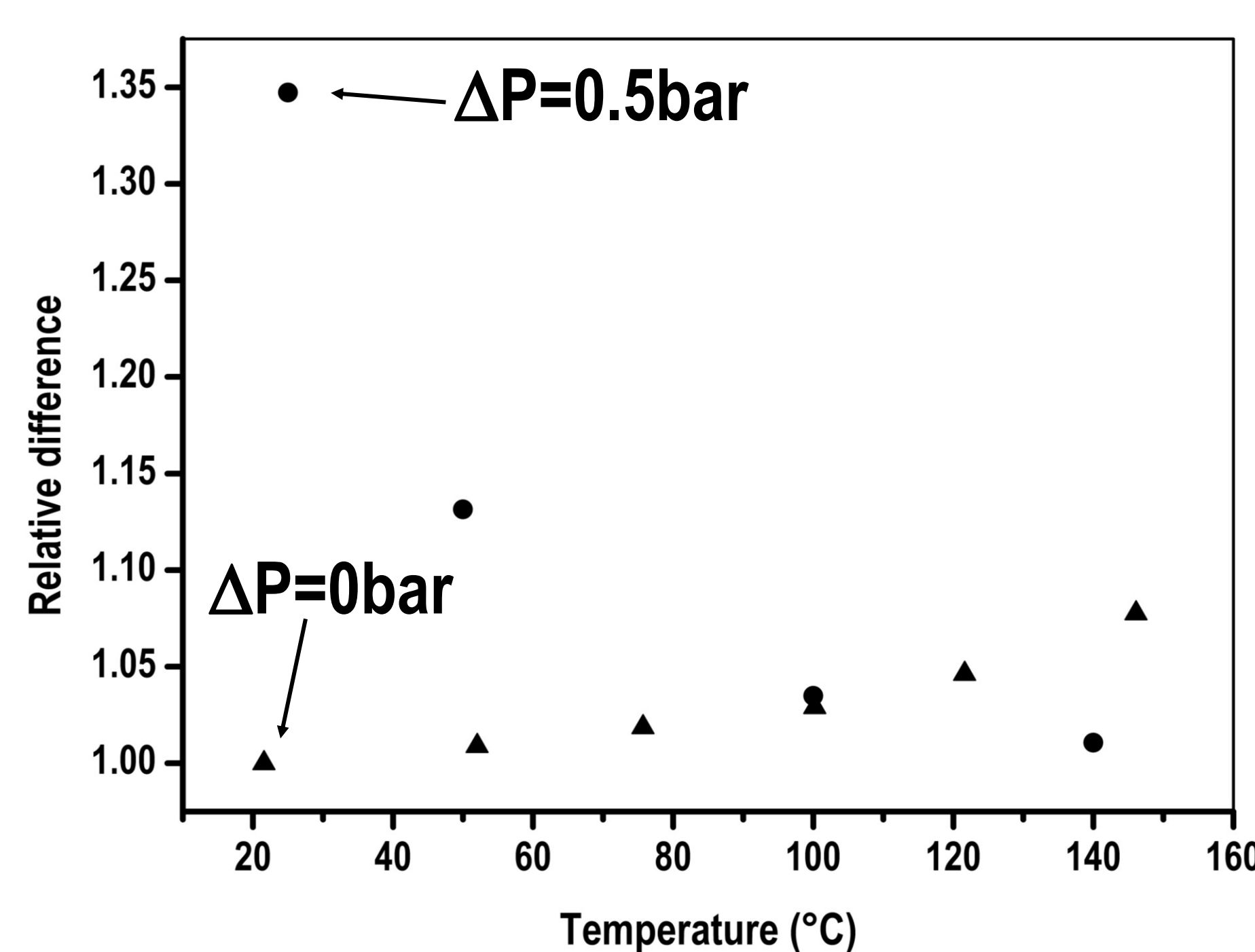
A laser-photoacoustic detection based gas permeation measuring system is developed and several of its outstanding features are demonstrated. There are two permeation testing methods that can be adapted for permeation measurements through rock samples. The basic version is based on the standard ISO 15105-2 using the photoacoustic system as a detection unit. For nanopore size rocks in which various transport and surface processes are present simultaneously, there is a possibility to apply the so called immersion method, which can give more information about the fluid flow properties of the sample. We tested the system for different type of rock samples having pore diameter in the range between few nanometres and few micrometres. Test conditions were varied in a wide range: pressures and temperatures were increased from the ambient conditions up to 10 bara and 140°C, respectively.

PHOTOACOUSTIC DETECTION:

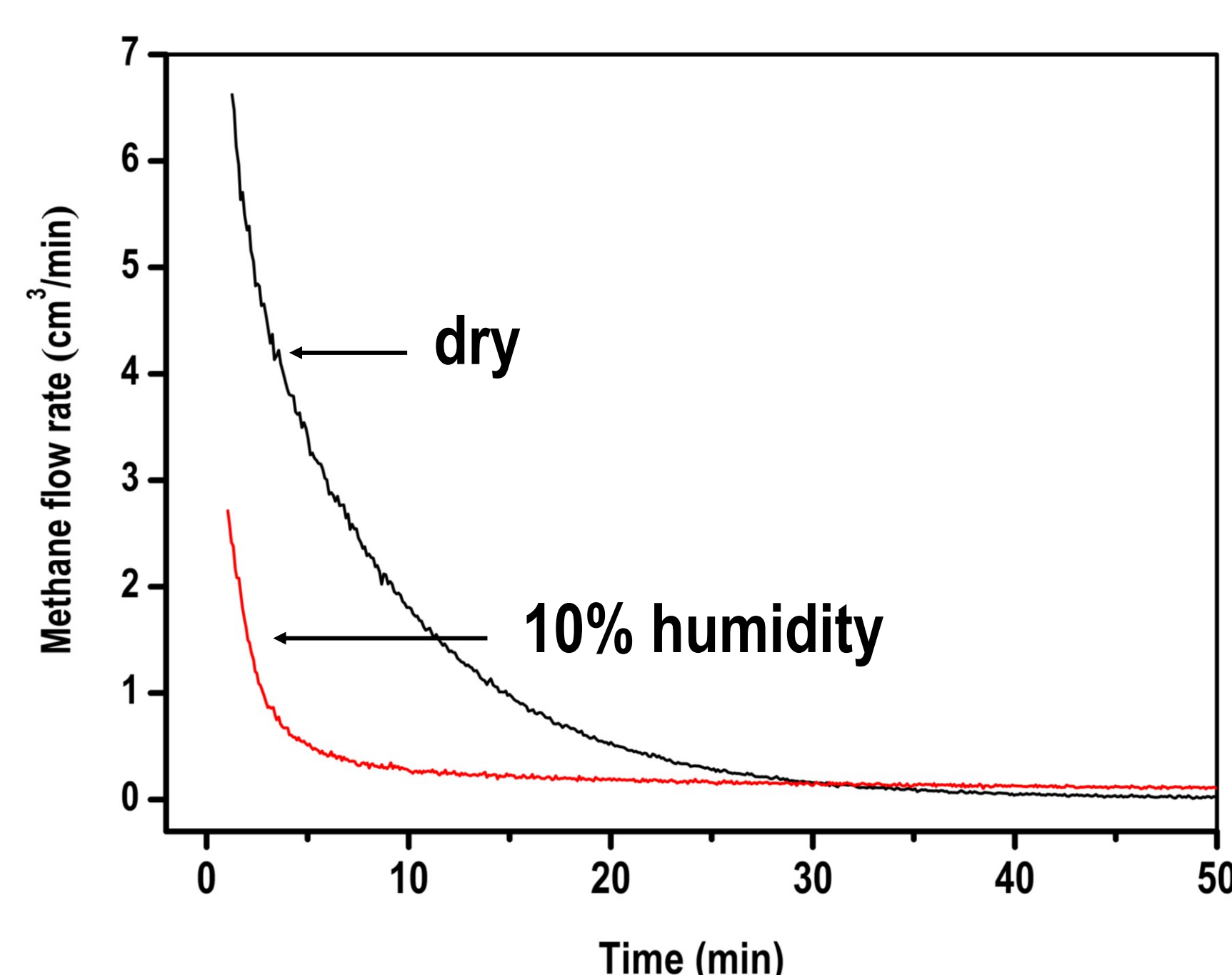
- Selective detection: CH₄, CO₂, H₂O, H₂S, NH₃, O₂, BTEX, O₃ etc.
- Testing diffusion of gas mixture components selectively
- Sensitive detection – low production rates can be analyzed
- High pressure and high temperature test conditions
- Multichannel and integrating versions



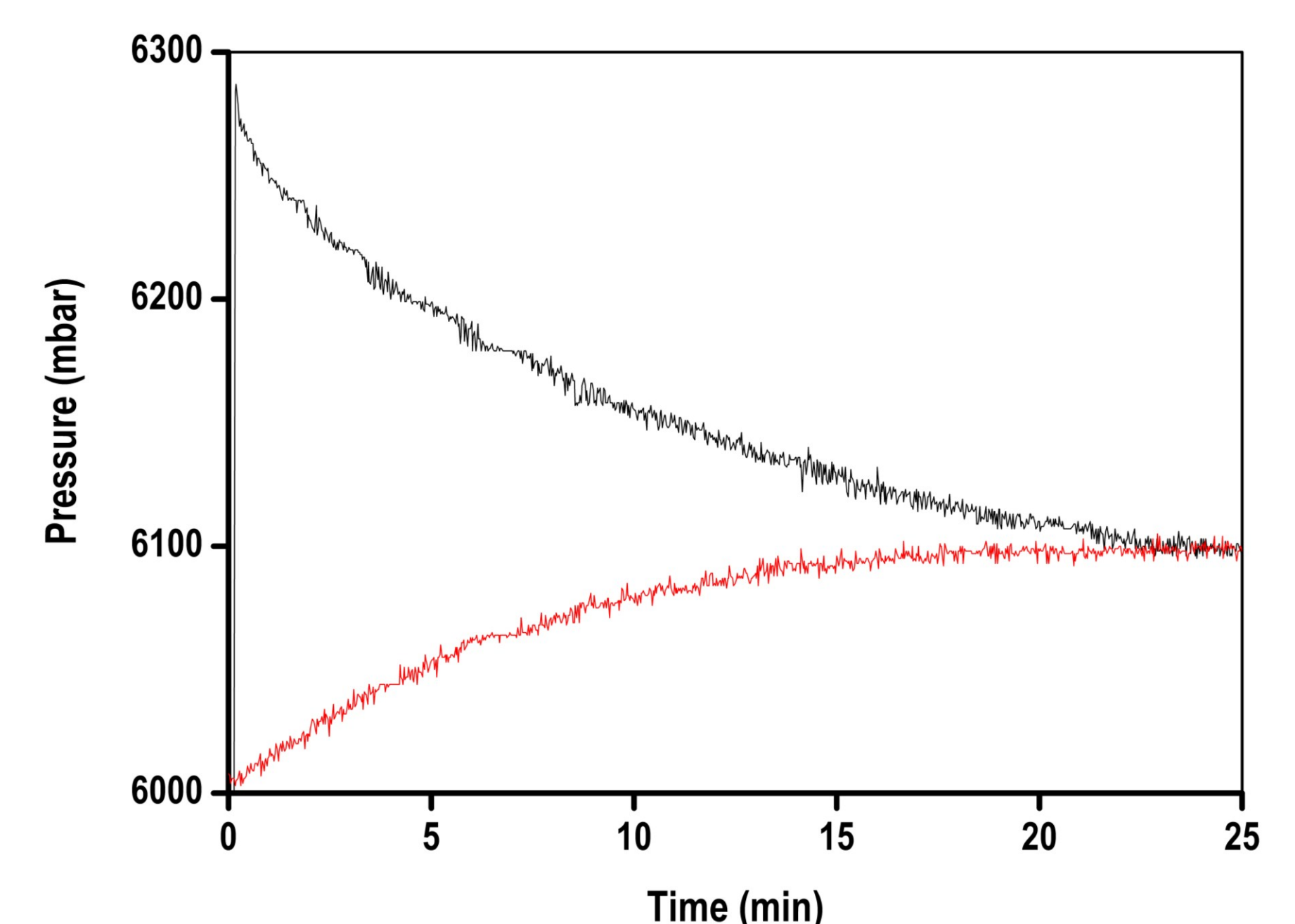
Effect of pressure difference on methane gas transmission rate in mudrock samples.



Detected by novel photoacoustic permeation testing technique



Methane production measurement on (un)conventional type of core sample by immersion and pulse decay methods.



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