

## Seismic velocities and electric resistivities of natural and synthetic core samples bearing methane hydrate

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The authors examined the elastic velocity, damping constant, resistivity using the samples of the natural and artificial methane hydrate-bearing sediments in the condition which reproduce in-situ stress, pore-pressure and temperature. The artificial samples consist of Toyoura-sand and methane hydrate produced by using ion-exchange water and the samples are saturated by 3.5% NaCl brine. The results are as follows;

- a) The elastic velocities; with 10% increase of the methane hydrate content, P-wave velocity increase by 136km/sec and S-wave velocity increase by 101km/sec.
- b) Poisson's ratio; the Poisson's ratios are from 0.40 to 0.45 and are almost independent on the methane hydrate content.
- c) Resistivity; The resistivity of brine-saturated samples is about 2ohm-m with 10% initial methane hydrate content and is about 5ohm-m with 50% content and the rate of increase is almost 1ohm-m per 10% increase of the methane hydrate content.
- d) Damping constant (Q-value); The Q-values from P-wave are from 30 to 40 using the samples of 30-40% methane hydrate content.

In the presentation, the authors will show the experimental methods and equipments of this study and discuss the problem of element test for elastic wave velocity measurement, damping constant measurement and resistivity measurement.