

PV Module Reliability Workshop @ Golden, CO
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Volume Resistivity of EVA Encapsulant Sheet

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Background and Motivation

Potential-induced electrical corrosion of PV module

PVB vs EVA

	PVB	EVA
Volume Resistivity @23°C [Ωcm]	10^{11}	10^{14}
Rate of electro-corrosion between cell and frame	fast	slow

G. R. Mon and R. G. Ross, Proc. 18th IEEE PV Specialists Conference, Las Vegas, 1985, pp. 1142-1149.

EVA vs Ionomer-blend

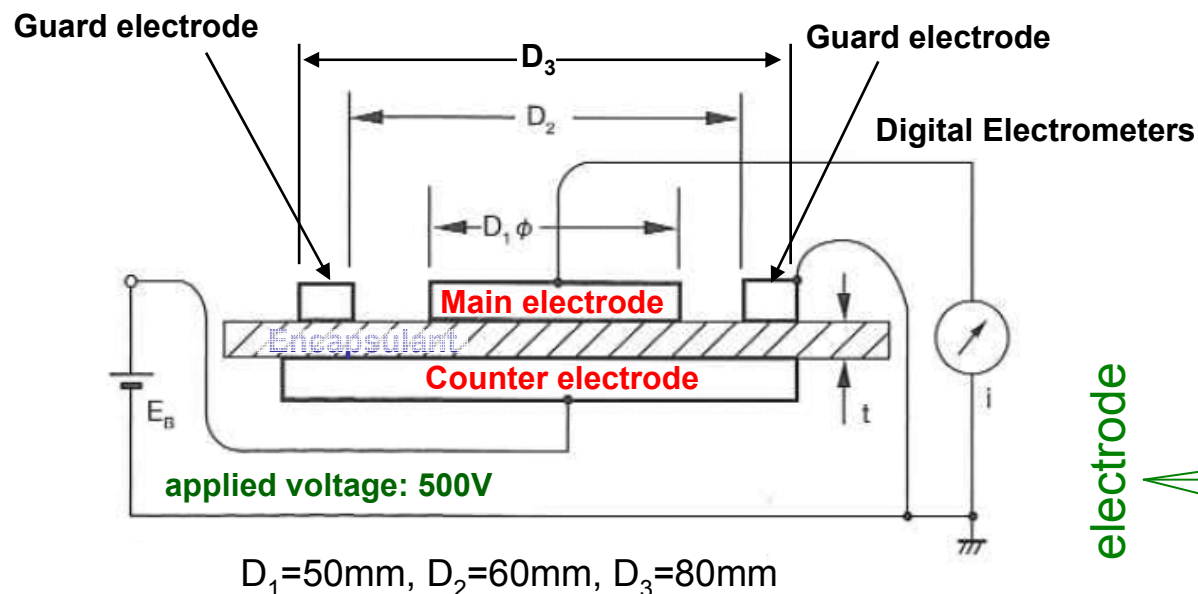
	EVA	Ionomer-blend
Volume Resistivity @23°C [Ωcm]	10^{14}	10^{16}
Rate of electro-corrosion at AR film on cell	fast (Na-ion diffusion?)	slow

P. Hacke *et al.* Proc 25th EU PVSEC, Valencia, 2010.

✓ Our goal is to make clear the relationship between rate of electrical corrosion and volume resistivity of EVA or its formulation.

✓ Our first step is to know volume resistivity of EVA sheets with different VA content and formulation

Measurement according to IEC 60093



electrode

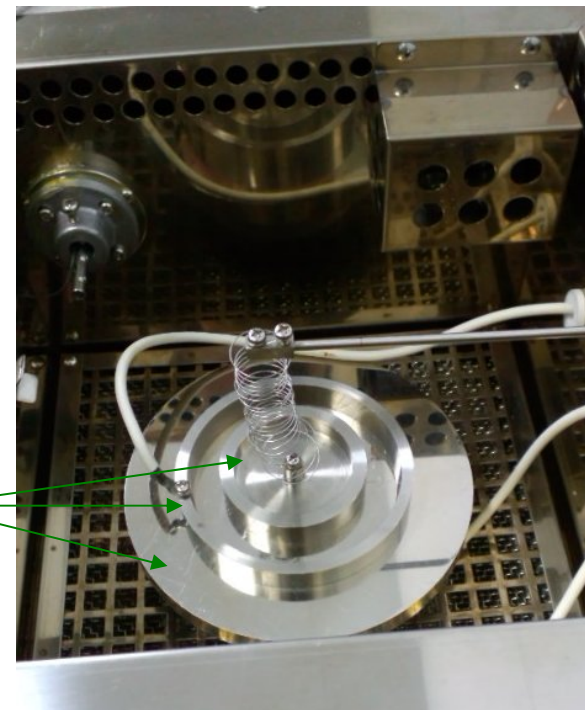


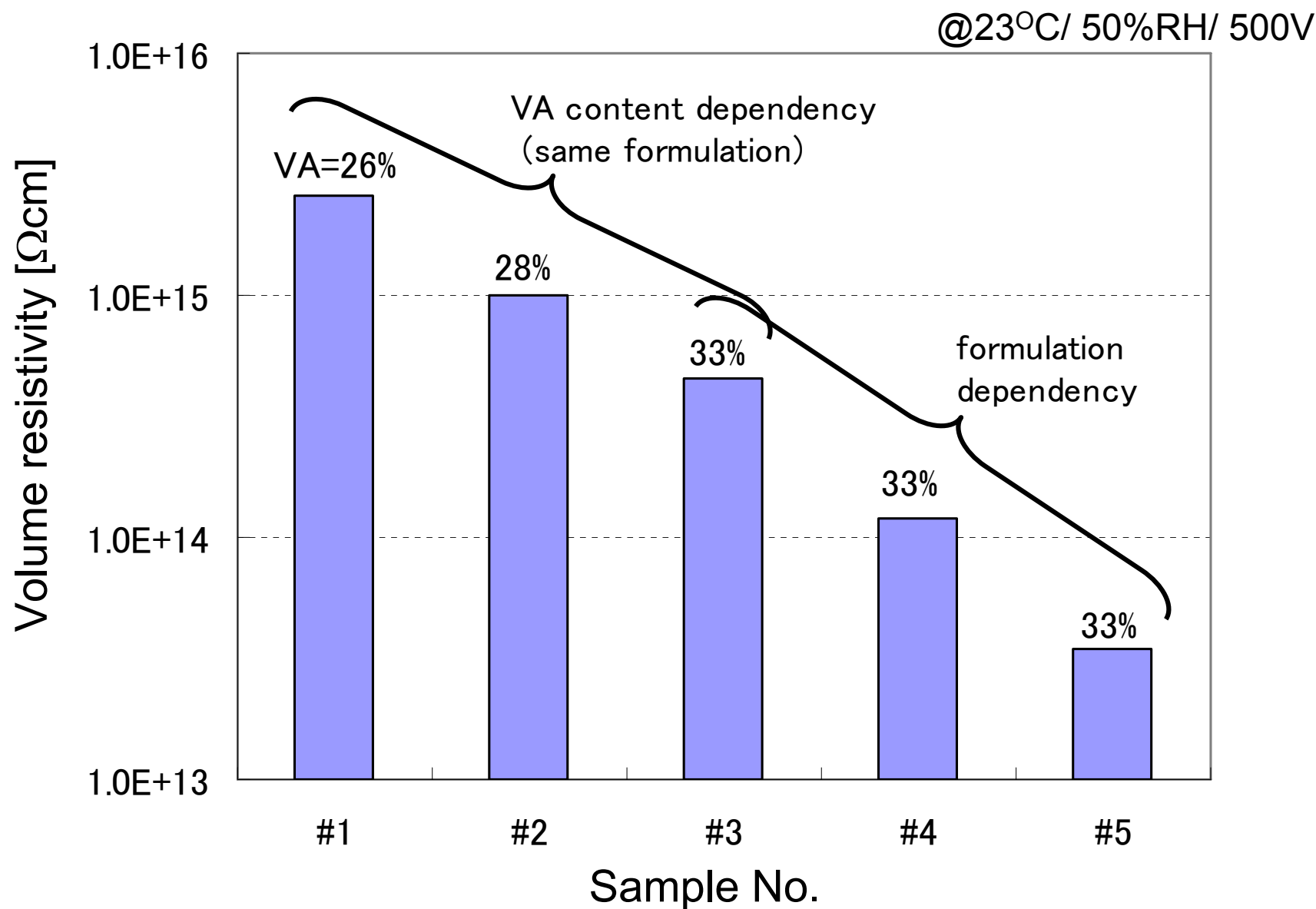
Photo of electrodes for measurement of volume resistivity

Sample size (W x L x T) : 10 x 10 x 0.045 [cm]

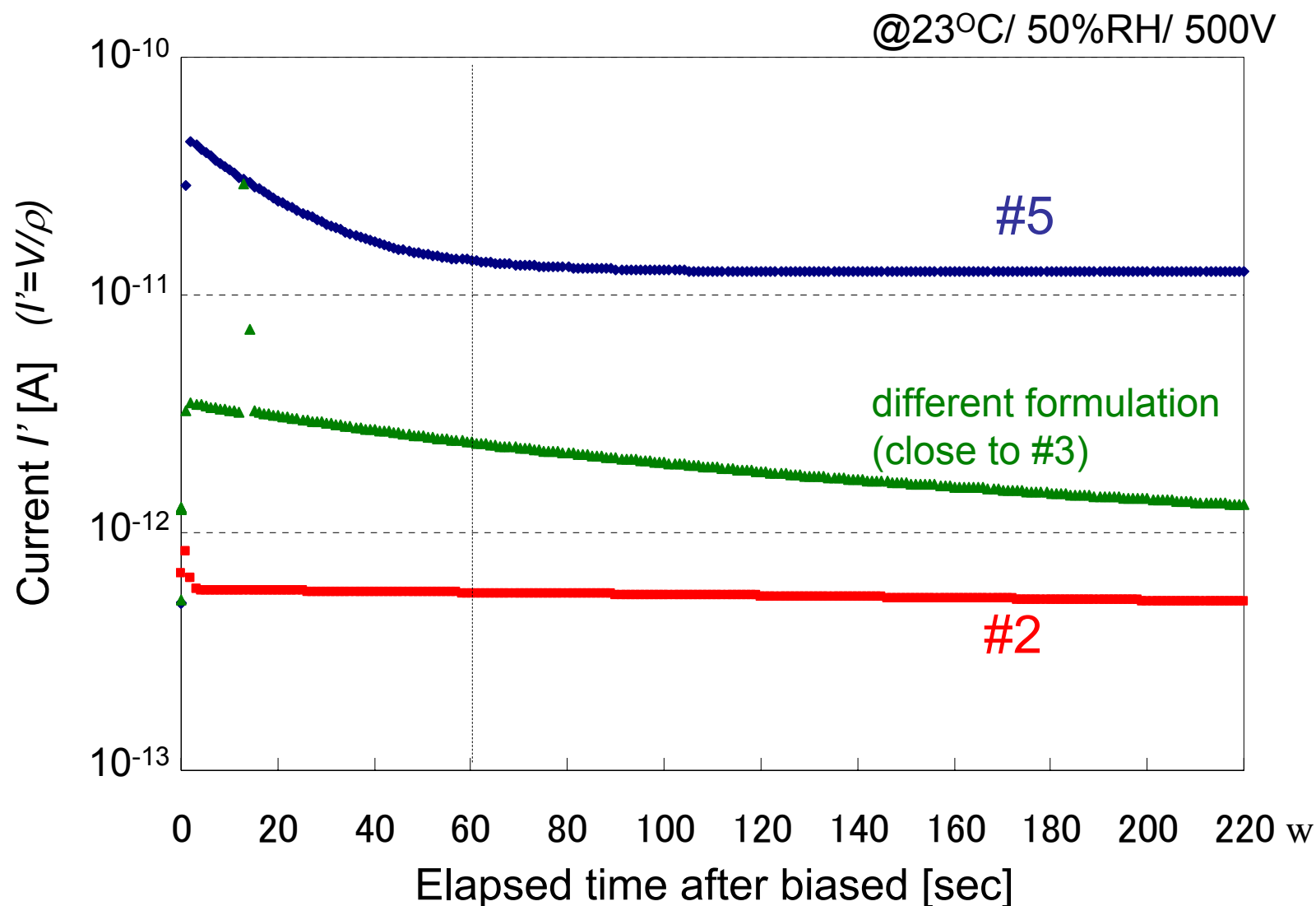
The number of measured specimen : 5

Measurement environment : 23 °C / 50% relative humidity (RH)

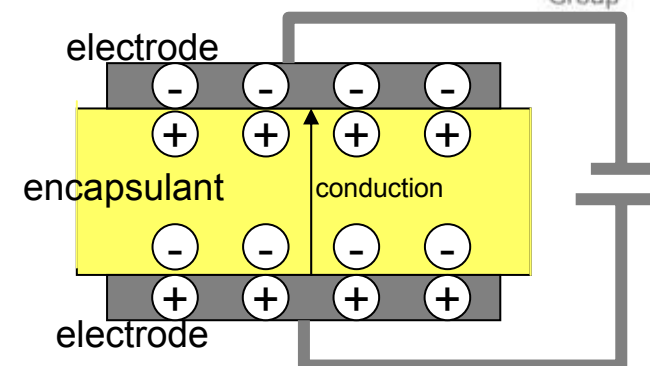
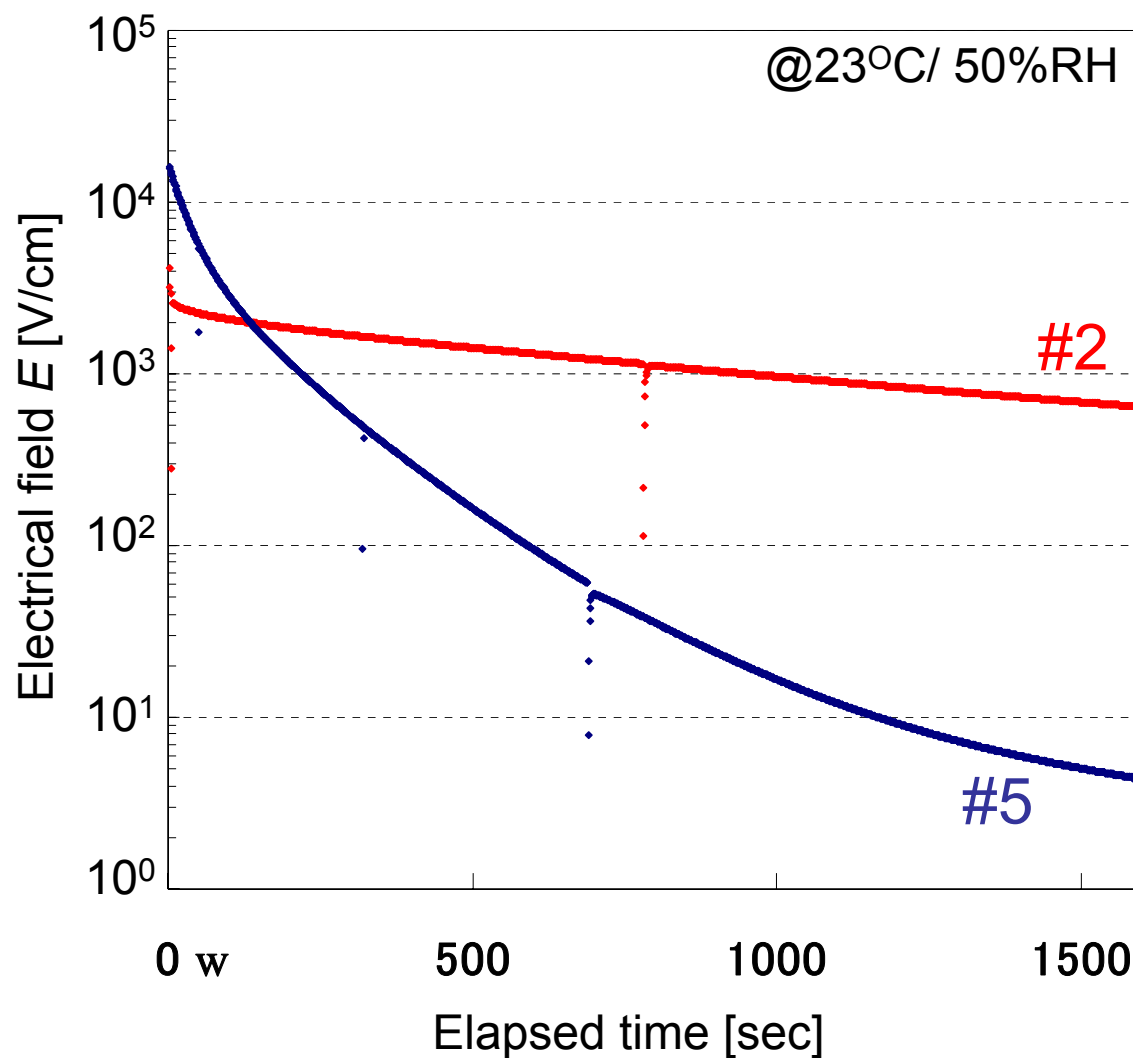
Volume resistivity of EVA sheet



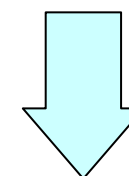
Transient Phenomena during measurement



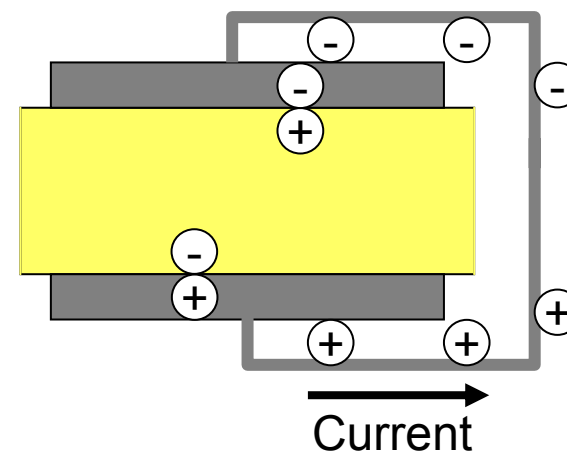
Discharge after measurement



Charge-up & conduction



Short-circuit



discharge

Summary and Future works



- ✓ Volume resistivity of EVA ranged from 10^{13} to 10^{15} [Ωcm], even though these are called as “EVA encapsulant sheet.”
- ✓ We found the slow transient change in current for some types of formulation during measurement of volume resistivity.
- ✓ We can observe discharge phenomena depending on its formulation after measurement and then short-circuit.
- ✓ We have been conducting research related to electrical corrosion using these EVA samples with different volume resistivity. We will share some data near future.