Interpenetrating polymer networks based on commercial silicone elastomers and ionic networks with high dielectric permittivity and self-healing properties

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Publication date:
2016

Document Version
Peer reviewed version

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2.2.5

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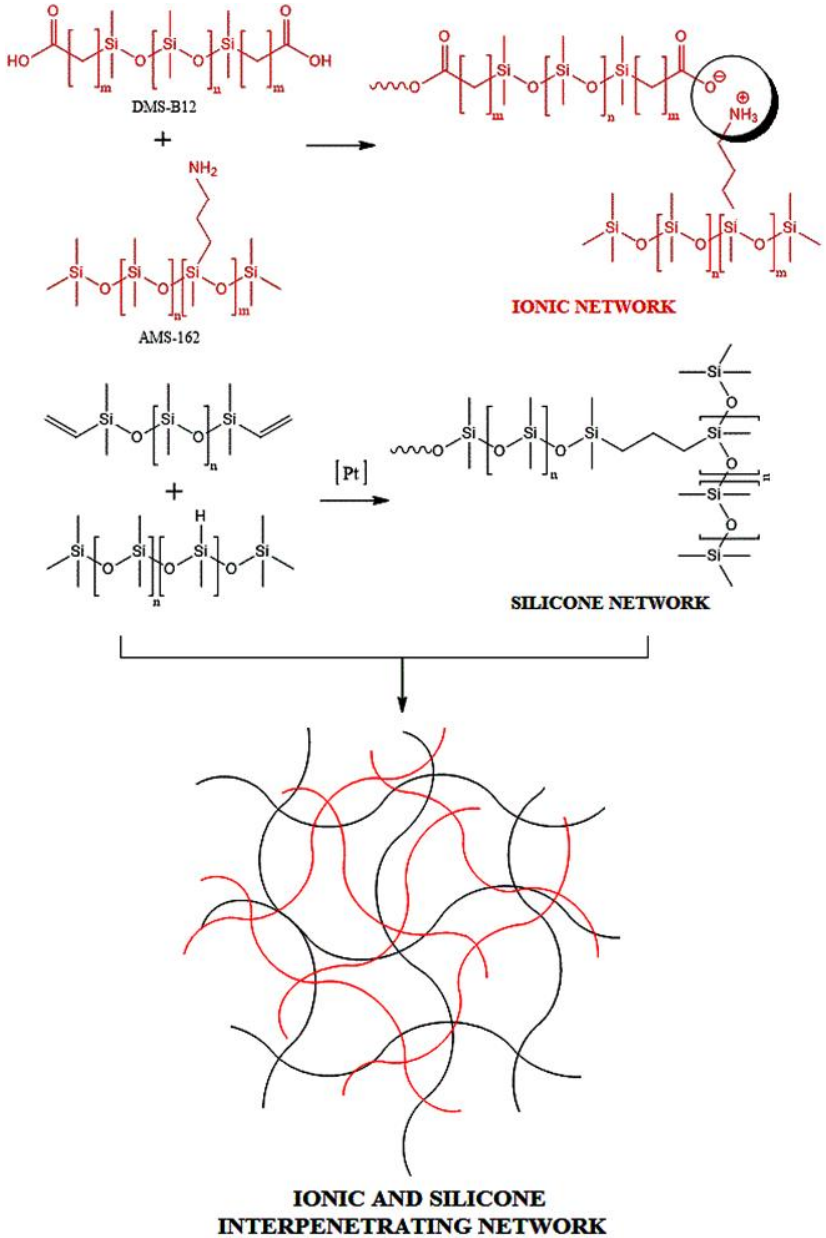

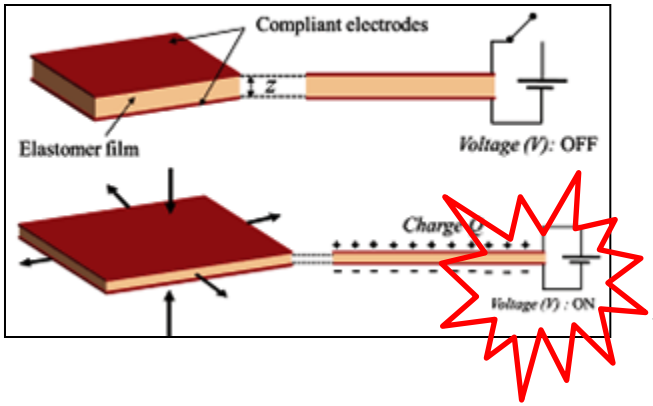

Goal:
DRIVING VOLTAGE
↓
Actuation Performance= ε'/Y

IPNs:

Ionically assembled silicone polymers:

- Softening effect
- Very high dielectric permittivity
- Self-healing properties

+

Covalently cross-linked silicones:

- Mechanical integrity
- High breakdown strength

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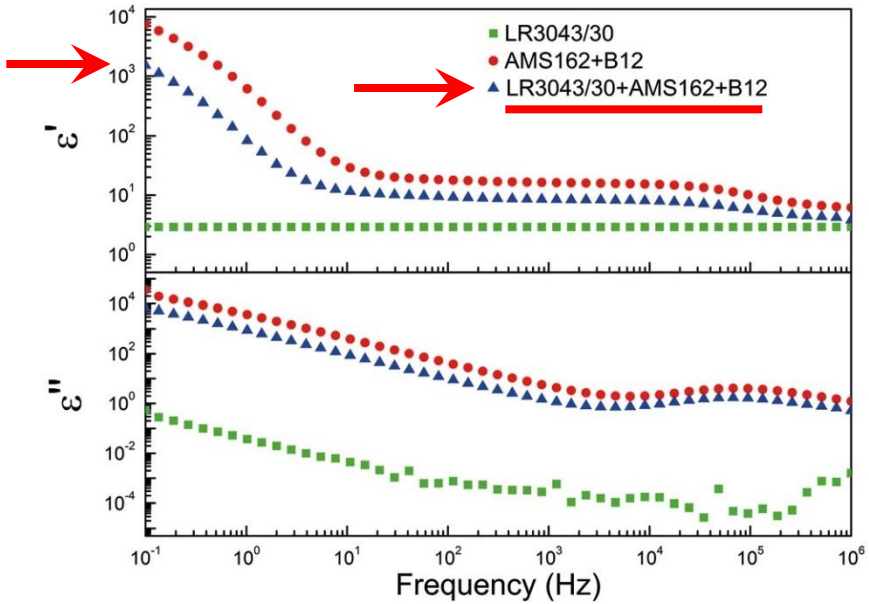
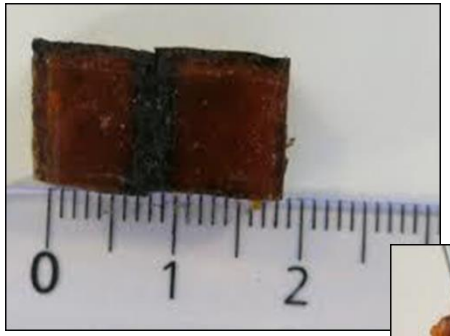
… Overview of the improved properties





More than 100% elongation of the reassembled samples

INCREASING IN **LIFE-TIME** of DEs

		Y= 3G' [kPa] (0,01 Hz)	Tan δ (rheo) (0,01 Hz)
Pure PDMS		64,3	0,06
Commercial silicone LR3043/30		252,3	0,08
AMS162 + B12		37,3	0,01
IPNs LR3043/30 : (AMS162+B12)	**70 wt% : 30 wt%**	255,1	0,10
	50 wt% : 50 wt%	113,7	0,08
	30 wt% : 70 wt%	30,9	0,05
	10 wt% : 90 wt%	30,5	0,03

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… For more informations you can visit my poster

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