



Proton Conductivity Studies of Novel Organic Polymer

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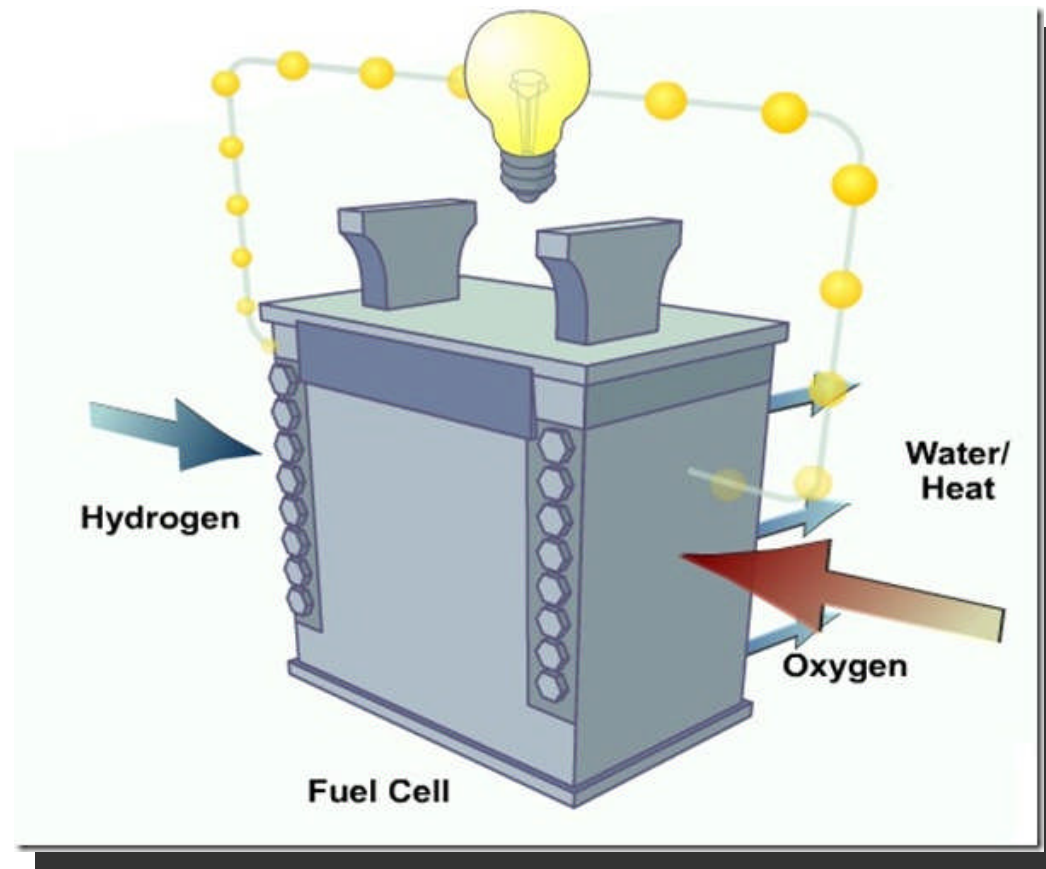
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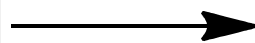
Content

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- Synthesis of Novel Organic Polymer (SBNN₁)
- Electrochemical Impedance Analysis of SBNN₁
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- Acknowledgement

Fuel Cells



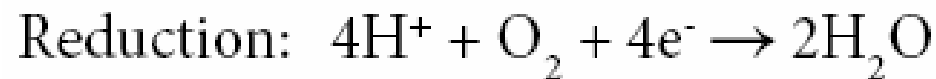
FUEL ENERGY



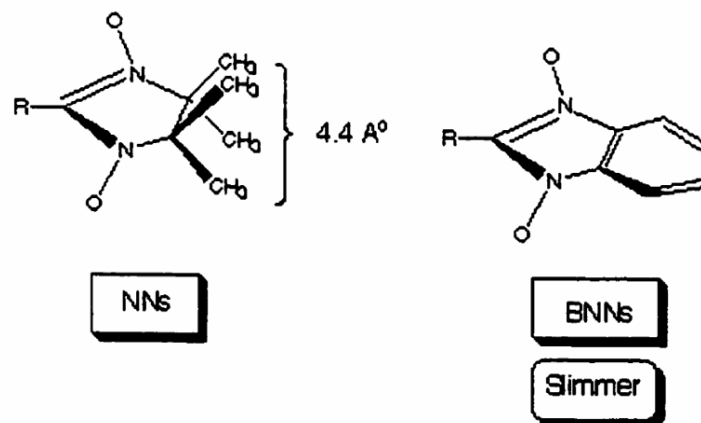
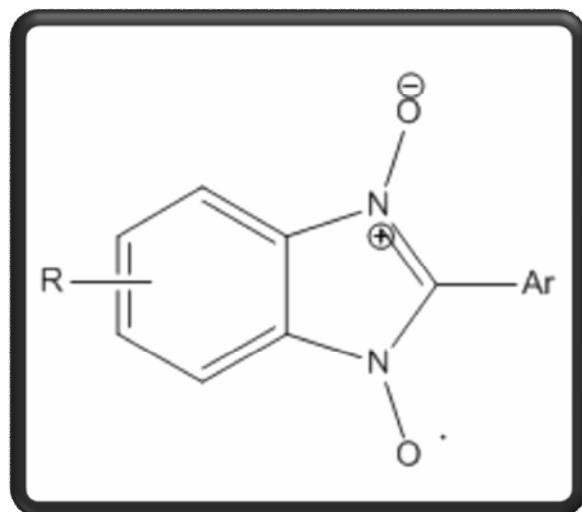
ELECTRICAL ENERGY

http://www.carblogindia.com/wpcontent/uploads/2011/02/fuelcell_thumb.jpg

What is function of proton exchange membrane (PEM) in fuel cells?

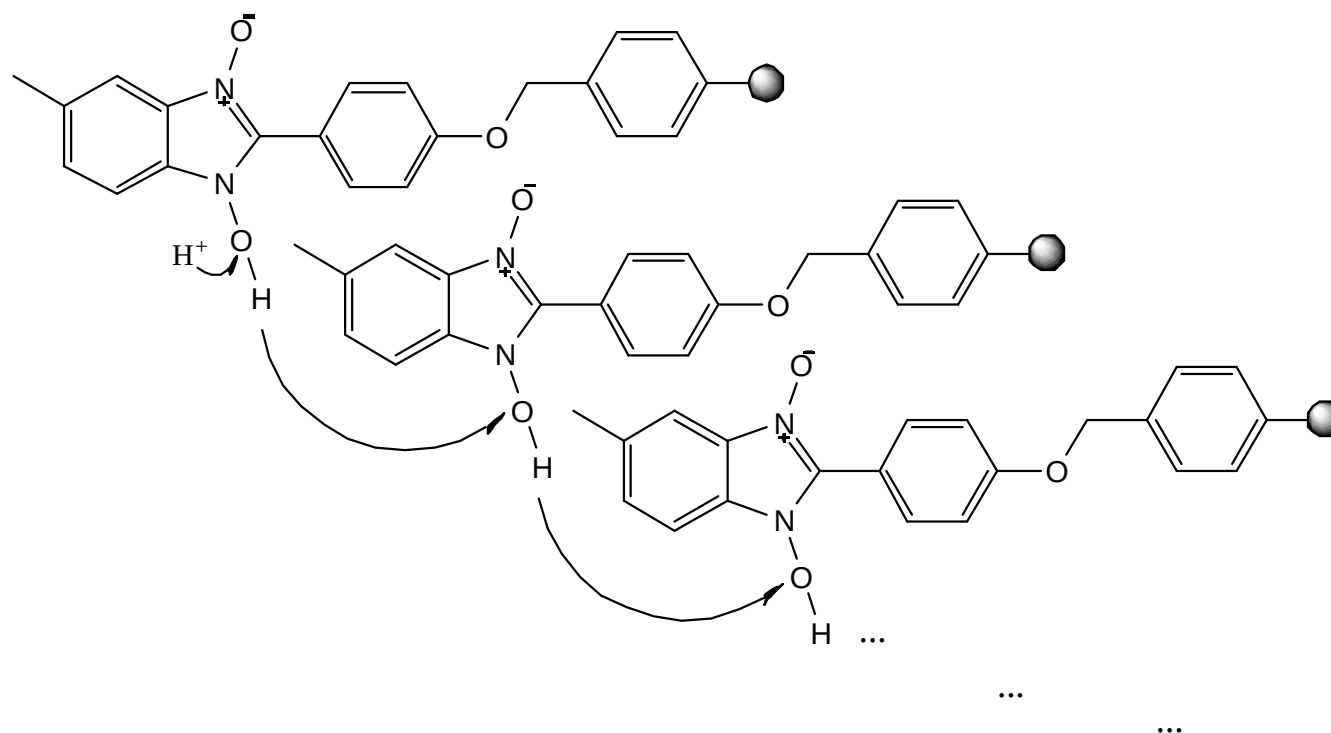


Benzimidazole Nitronyl Nitroxides

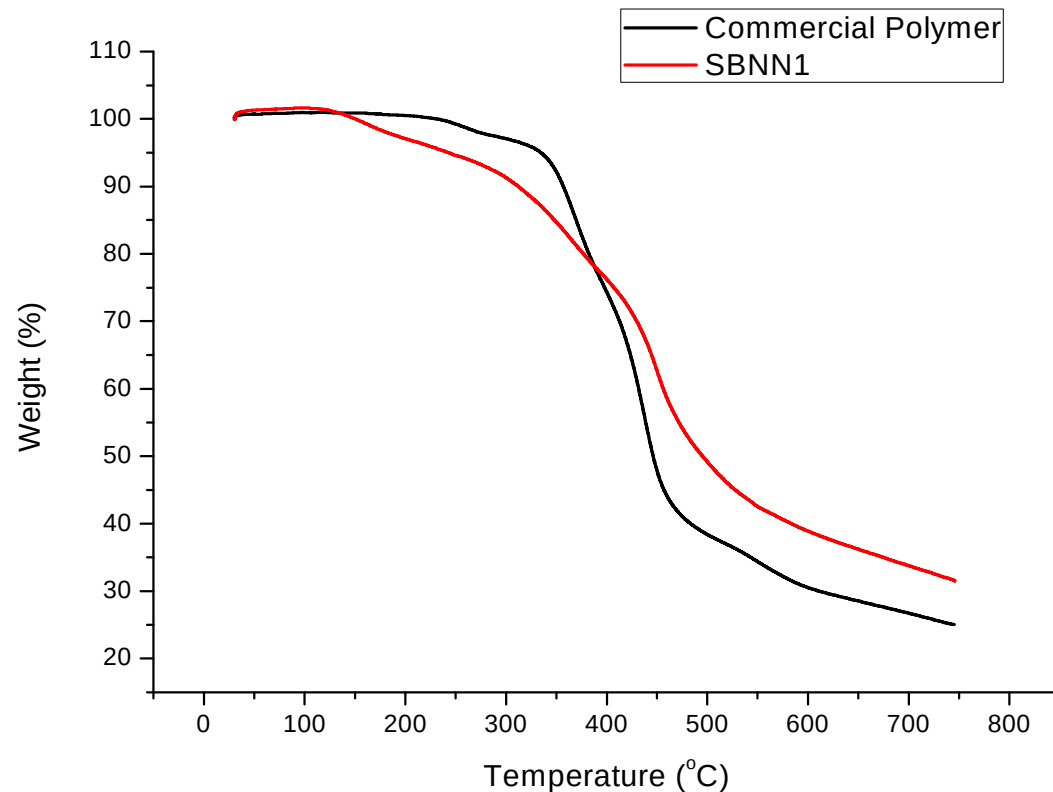


- Analogues of nitronyl nitroxide radicals (NNs)
- Highly resonance stabilized radicals (two equivalent NO groups and of large negative charges on O atom)
- High spin density

Proton Conductivity Mechanism of SBNN1



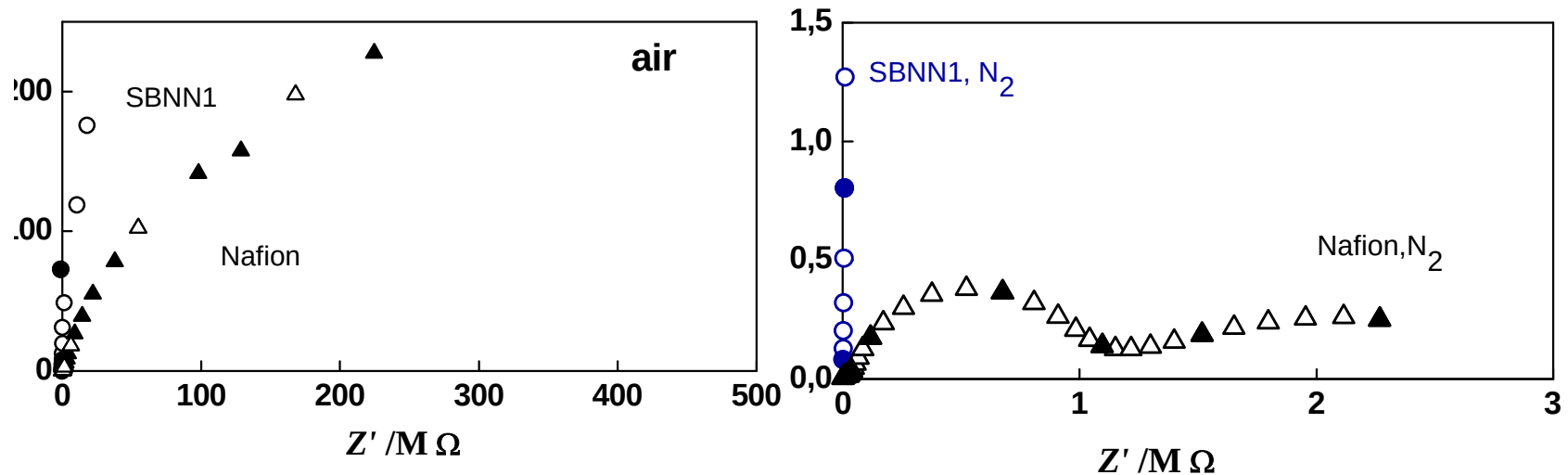
Thermal Stability of SBNN1



- Purchased aldehyde has been found to retain 100 % of the mass up to about 250 °C. It was observed to lose 5 % of its mass at 340 °C, about 62 % at 500 °C,
- SBNN is stable up to 150 °C, it has lost some mass gradually from beginning of 100 °C. It only lost 5% of its mass upto 240°C which is mostly associated with absorbed water.
- The mass loss became more pronounced after 400 °C. This polymer lost 51 % of its mass at 500°C.

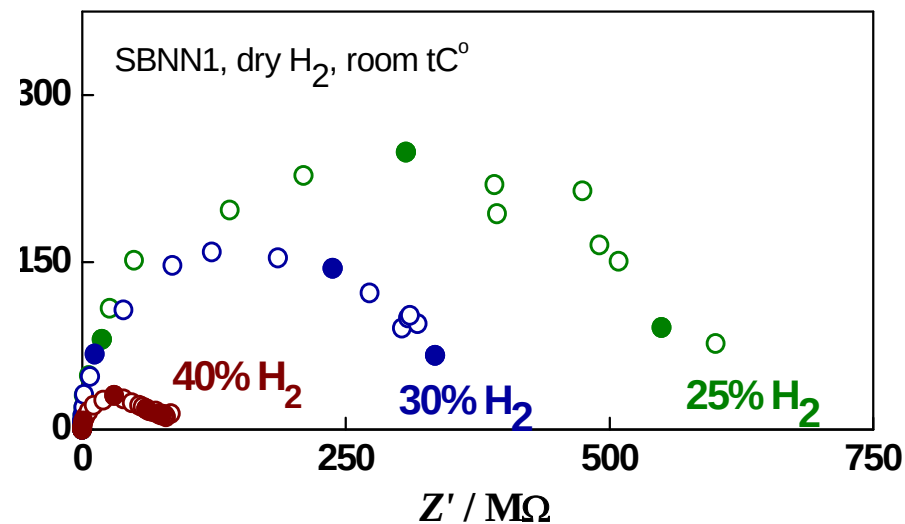
Impedance Measurements

Comparison between Nafion and SBNN1

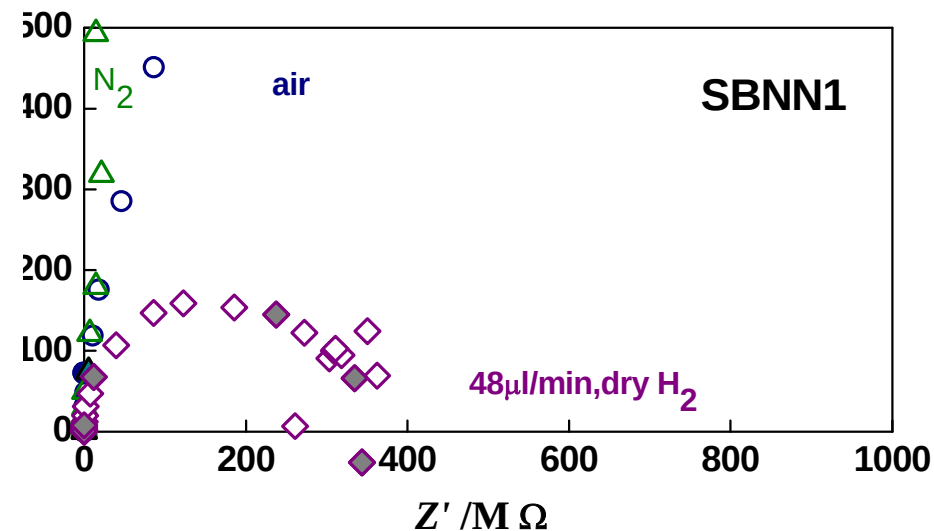


Measurements in hydrogen

Measurements of **SBNN1** in dry H₂ show that the material SBNN1 has proton conductivity, which increases with the increase of the gas flow



demonstrate the existence of proton conductivity in SBNN1.





Conclusion

- The results obtained by impedance spectroscopy measurements of **SBNN1** show that the material has proton conductivity. It is much lower than the one measured on **Nafion** samples prepared by the same technological procedure.



Acknowledgements

- Prof. Dr. Zdravko Stoyanov
- Prof. Dr. Daria Vladikova
- Assoc. Prof. Dr. Burak Esat
- Dr. Emiliya Mladenova
- Ivaylo Genov



Thank you for listening...

Synthesis of Novel Organic Polymer (SBNN1)

