# New Generation Novolac: Chemistry of Poly(phenylenemethylene)

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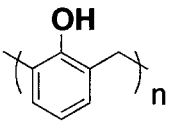
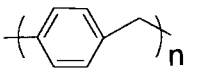
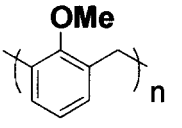
Novolac (phenolic resin)[1] and related polymers have been industrially very important as cure, adhesive, photoresist or polymer composite. These materials exhibit excellent heat stability, mechanical properties, reactivity and so on. It is suggested that these significant characters are derived from a rigid-rod-like poly(phenylenemethylene) backbone. However, little is known about the synthesis of a new functional aromatic polymer from this viewpoint. The chemistry of novolac has been limited to polymers which consist of phenolic compounds such as phenol or cresol. It is very important to extend the chemistry of novolac for various electron-rich aromatic compounds, and to create new functional materials based on the poly(phenylenemethylene) backbone.




Phenol Novolac




Poly(phenylenemethylene)




Anisole Novoalc

In this presentation, we report the synthesis and properties of new generation novolacs derived from alkoxybenzene derivatives such as anisole, phenethol, and 1,3-dimethoxybenzene. For example, anisole novoalc was prepared by the sulfuric acid-catalyzed addition-condensation of the anisole (1eq.) with formaldehyde (paraformaldehyde) (2eq). The resulting polymer was well-soluble in chloroform, THF, and toluene. The characterization and thermal properties of the polymer is also described.

**References**

[1] A. Knop and L.A. Plato, "Phenolic Resins" Springer-Velag, Berlin (1985).
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[3] D.-M. Shin, N. Ozeki, Y. Nakamoto and G. Konishi, *Macromol. Res.*,

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