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Phosphorus, Sulfur, and Silicon and the Related Elements

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t713618290>

Poly(Organophosphazenes): Use in the Improvement of Standard Materials. Application to the Modification of Surface Properties of Poly(Vinyl Alcohol)

Lydie Pemberton^a; Rogger De. Jaeger^a; Leon Gengembre^b

^a L.A.S.I.R. (CNRS UPR A 2631 L), Villeneuve d'Ascq, France ^b Laboratoire de Catalyse Hétérogène et Homogène (CNRS URA 402), Université des Sciences et Technologies de Lille, Villeneuve d'Ascq, France

To cite this Article Pemberton, Lydie , Jaeger, Rogger De. and Gengembre, Leon(1996) 'Poly(Organophosphazenes): Use in the Improvement of Standard Materials. Application to the Modification of Surface Properties of Poly(Vinyl Alcohol)', *Phosphorus, Sulfur, and Silicon and the Related Elements*, 111: 1, 35

To link to this Article: DOI: 10.1080/10426509608054664

URL: <http://dx.doi.org/10.1080/10426509608054664>

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POLY(ORGANOPHOSPHAZENES) : USE IN THE IMPROVEMENT OF STANDARD MATERIALS. APPLICATION TO THE MODIFICATION OF SURFACE PROPERTIES OF POLY(VINYL ALCOHOL)

LYDIE PEMBERTON*, ROGER DE JAEGER*, LEON GENGEMBRE**
*L.A.S.I.R. (CNRS UPR A 2631 L) et **Laboratoire de Catalyse Hétérogène et Homogène (CNRS URA 402), Université des Sciences et Technologies de Lille, 59655 Villeneuve d'Ascq, France

Abstract Modification of surface properties of poly(vinyl alcohol) by grafting of poly(organophosphazenes).

Key words : Surface modification - Poly(organophosphazene) - Poly(vinyl alcohol)

If the gas-barrier properties of poly(vinyl alcohol) PVA are among the best of any synthetic polymer when dry, they are poor under high humidity conditions, and therefore it is desirable to reduce this moisture sensitivity [1]. The great variety of structures of poly(organophosphazenes) POPZ gives rise to very diverse physical and chemical properties. For instance, these compounds can be hydrophobic or hydrosoluble, electrical conductors or insulators, photodegradable or photoresistant [2]...Therefore, our objective was to confer to PVA some of these properties, especially hydrophobicity, while conserving its bulk properties. We have reported two methods of grafting POPZ polymers onto PVA films surface. The first consists in a chemical reaction between PVA and the poly[(phenoxy)(p-ethylphenoxy)phosphazene] functionalized with maleic anhydride, the second in free-radical initiated grafting of the poly[(phenoxy)(p-ethylphenoxy)(o-methoxy p-allylphenoxy)phosphazene]. The surfaces of the modified polymer films have been studied by FTIR-ATR and UV spectroscopies, contact angle measurements, and XPS analysis. In both cases, a great enhanced hydrophobicity of the film surfaces has been observed.

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