

EPOXY BASED HYBRID MATERIALS USING FUNCTIONALISED ALKOXYSILANES.

J. Tenas¹, Y. R. de Miguel¹, L. Irusta², M. J. Fernández-Berridi²

*1LABEIN-Tecnalia, Centre for Nanomaterials Applications in Construction and Nanostructured and Eco-efficient Materials for Construction Unit, Associated Unit LABEIN-Tecnalia/CSIC,
Parque Tecnológico de Bizkaia. Edificio 700. C/Geldo. Derio. Spain*

*2Department of Polymer Science and Technology, University of Basque Country
Centro Joxe Mari Korta. Avda. Tolosa 72. Donostia-San Sebastián. Spain*

jtenas@labein.es

The hybridisation of epoxy resins using functionalised alkoxy silanes is an area of vast academic and industrial interest [1-3]. Previous studies [4, 5] have shown that hybridisation, in some cases, can lead to highly homogeneous materials with superior properties. However, there is still a lack of understanding of the relationship between the structure, composition, method of preparation and final material properties.

The aim of our work is to study the effect of the use of different alkoxy silane functionalities, such as amine, epoxy, phenyl, etc. upon the final properties of the materials.

In this poster, we will present selected results from DSC, TGA, DMTA, SEM and IR analysis of hybrids prepared from the following alkoxy silanes (Figure 1).

The thermal, mechanical, morphological and structural properties and the method of preparation of these materials will be discussed with reference to the functionalities used in each case.

References:

- [1] Judeinstein, P; Sanchez, C. J. Mater. Chem., **6** (1996), 511 – 525
- [2] Lu, S; Zhang, H.; Zhao, C.; Wang, X. J Mater. Sci., **40** (2005), 1079-1085
- [3] Matejka, L; Dušek, K; Pleštil, J; Kříž, J; Lednický, F. Polymer , **40** (1998), 171-181
- [4] Prezzi, L.; Mascia, L. Adv. Polym Tech, **24** (2005), 91-102
- [5] Ochi, M; Takahashi, R. J. Polym. Sci. Pol. Phys, **39** (2001), 1071-1084

Figures:

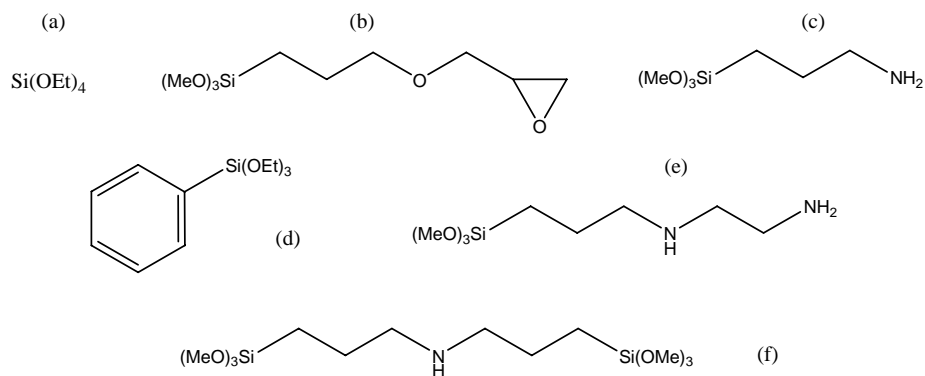


Figure 1: a) TEOS; b) (3-Glycidyloxypropyl)trimethoxysilane; c) (3-Aminopropyl)triethoxysilane; d) Phenyltriethoxysilane; e) N-[3-(Trimethoxysilyl)propyl]ethylenediamine; f) Bis[3-(trimethoxysilyl)propyl]amine