

## **Degradation Mechanism of Automotive Refinish Coatings Exposed to Biological Substances: The Role of Cross-Linking Density**

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**Abstract :** Environmental factors can deteriorate the automotive coatings significantly. Such as UV radiations, humidity, hot-cold shock and destructive chemical compounds. Furthermore, some natural materials such as bird droppings and tree gums have the potential to degrade the coatings as well. The present work aims to study the mechanism of degradation for two automotive refinish coating (PU based) systems exposed to two types of biological materials, i.e. Arabic gum and the simulated bird dropping, pancreatin. To reach this goal, effects of these biological materials on surface properties and appearance were studied using different techniques including digital camera, FT-IR spectroscopy, optical microscopy, and gloss measurements. In addition, the thermo-mechanical behavior of coatings was examined by DMTA. It was found that cross-linking had a crucial role on the biological resistance of clear coat. The higher cross-linking enhanced biological resistance.

**Keywords :** refinish clear coat, pancreatin, Arabic gum, cross-linking, biological degradation

**Conference Title :** ICMAME 2014 : International Conference on Materials, Automotive and Mechanical Engineering

**Conference Location :** Penang, Malaysia

**Conference Dates :** December 04-05, 2014