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Characterization of Epoxy-Silane Films by Combined Scattering Techniques. Peng Wang, Dale W. Schaefer, Dept. of Chemical and Materials Engineering, Univ. of Cincinnati, Cincinnati, OH 45221.

Bis-silanes with the general formula of $(\text{RO})_3\text{Si}(\text{CH}_2)_3\text{-R}'\text{-(CH}_2)_3\text{Si}(\text{OR})_3$, where OR represents an alkoxy group and R is an organic functionality, show excellent performance as coupling agents in anti-corrosion films; Epoxy resin also has superior chemical and corrosion resistance as well as outstanding mechanical toughness. A combination of silane and epoxy is an excellent coating system with high hardness based on the mixture of epoxy (EPI-REZ™ 5003-W-55) and bis-sulfur silane ($\text{R}' = \text{S}_4$). This one step coating provides excellent anti-corrosion protection of metals substrates. The goal of this study is to fully understand this two component system. Morphology, thickness, chemical composition, water barrier properties, response to organic solvents as well as hydrothermal degradation were investigated using x-ray and neutron reflectivity; Phase separation was studied by small angle scattering of neutron and X-ray scattering. Minority phase distribution profile was elucidated by using GISAXS.

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