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## Stochastic Variations of Cathodoluminescent Intensity of Bisphenol/Amine Epoxy Exposed to Energetic Electron Bombardment

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Spring 2014  
Utah State University's  
Student Showcase



*Utah State University  
Logan, UT  
April 11, 2014*

***Stochastic Variations of Cathodoluminescent Intensity of  
Bisphenol/Amine Epoxy Exposed to Energetic Electron  
Bombardment***

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***Abstract***

When highly disordered insulating materials are subjected to energetic electron bombardment they can emit photons. This process is termed "cathodoluminescence." This occurs in the space plasma environment and is an important phenomenon to understand when designing any object to be put into space. Light emitted from spacecraft materials can affect optical detection, and can cause stray-light contamination in space-based observatories. The Materials Physics Group at Utah State University uses an ultra-high vacuum chamber equipped with electron guns and a cryostat to control the sample temperature to simulate the space environment and to observe its effects on sample materials. Previous studies have looked at the cathodoluminescent properties of a variety of materials, as incident electron energy and current were modified. The purpose of this study is to observe the statistical variation of a large sample set of a particular material (bisphenol/amine epoxy) subjected to the same environmental conditions. This provides important information on the stochastic variability which can be expected when using a particular material and the precision of ground-based laboratory experiments.