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Addressing Stain Resistance of Coatings by New Experimental and Modeling Techniques

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Today's discerning interior architectural coating consumers value paints that offer low odor, improved application and end use performance attributes such as flow and leveling, scrub and stain resistance etc. Stain resistance is the ability of the coating surface to withstand discoloration caused by contact with various type of stains. There is a concerted effort in the coating industry to develop interior water-based paints with improved stain resistance to hydrophilic and hydrophobic stains. Achieving stain-resistant properties for the paints require a combination of tailored polymer dispersions, balanced paint formulation ingredients and efficient use of rheology modifiers. This study describes new techniques such as molecular modeling (which looks at interactions between key components in paint such as binders, rheology modifiers etc), Atomic Force Microscopy (AFM-which looks at the paint surface to decipher the distribution of various components such as thickener and stain molecules) and Quartz-Crystal Microbalance (QCM- which looks real time at the adsorption and desorption process of stains on paint surfaces) have been developed to get a better understanding regarding the major contributing factors that cause staining. The objective of the study is to understand the overall mechanism of stain formation and removal that should help in designing, formulating and fine-tuning improved stain-resistant coatings.

Biography

Zeena Cherian is a senior staff scientist in Ashland's Specialty Ingredients Coatings Innovation group in Wilmington, Delaware since 2016. She received a Master's degree in Materials Engineering from the New Jersey Institute of Technology (NJIT)-New Jersey, and a Master's degree in Polymer Technology from the Cochin University of Science and Technology, India. She is the recipient of American Coatings Award 2020.