

**SYNTHESIS AND CHARACTERIZATION OF MULTI-
PURPOSE EMULSION POLYMER FOR PAINTS AND
COATINGS USING VARIOUS MONOMER
COMBINATIONS.**

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DECLARATION

The work described in this dissertation was carried out by me in the Department of Materials Science & Engineering, University of Moratuwa, Sri Lanka under the guidance of Mr. S.V Udayakumara and has not been submitted elsewhere.

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ABSTRACT

Latex water-borne coatings are becoming increasingly popular due to their safety, environmental responsibility, and user-friendliness over solvent-base coatings. Most water borne coatings consist of acrylic as the binder resin. However, these water-borne coatings have drawbacks and show negative performance when exposed to certain weather conditions. Some of the detrimental effects, like blushing also known as water whitening, softening of the film ultimately lead to shorter lifespan of these water-borne products. Because of these unfavorable performances of the latex in the WB coatings; they have limitations in their use in exterior weather conditions, steel applications, and transparent wood coating applications. Considering all these factors, multi-purpose polymers are the new trend. As coatings and their raw material manufacturing is becoming increasingly competitive in the marketplace, polymers must possess innovative characteristics that set them apart. This research contributes to the advancement of multi-purpose resins those can be used not only in wall coatings but also in WB DTM and WB wood coatings those exhibit water resistance and related qualities, creating a product that is both more profitable and marketable for paint producers and the industry overall.

This study explores various polymer compositions, synthesized by the emulsion polymerization process using selected monomers to address those common issues with water-borne acrylic resins and their usability as multi-purpose resins. Polymer samples are synthesized by varying monomers, and other conditions like surfactants, initiators are constant. Properties like particle size, blushing resistance, and rust inducement are examined in polymers. In the second phase, 3 types of coatings are produced and evaluated for their properties.

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