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SYNTHESIS ANDCHARACTERIZATIONOF NEWBINDERSFOR EMULSION COATING APPLICATIONCONTAININGIN WATER BASED METHACRYLIC HYBRID RESINS

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ABSTRACT

Binder is an important ingredient in pigment coating as it is used to impart adhesion, gloss and flexibility to the dried film as well as binding the pigment particles together. Series of emulsion methacrylic copolymers having different composition ratios of methylacrylicacid (MAA) with butylacrylate (BuA), methylmethacrylate (MMA), styrene, poly vinyl alcohol (P.V.A) were prepared and characterized. The preparation was carried out in industrial scale in batch reactor at pH 7, using potassium persulphate(KPS) and Sodium metabisulfate ($Na_2S_2O_5$) as an initiators, Dodecyl Benzene Sulphonic acid SDBA as an emulsifier,and sodium dodecyl sulfonic acid SDBAS as co-emulsifier in presence of tri metylchlorosilane(TMCS) at 70^oC for 4 hours. The chemical structures of the prepared binders were characterized by FTIR and ^{1}HNMRspectra. The various physic-chemical properties ofemulsion methacrylic copolymers including density, viscosity, chemical resistance and volatile matter were studied. The resultsshow thatemulsion acrylic copolymers are readily soluble in aprotic polar solvents such as (Toluene, Acetone, Benzene, xylene, DMF, DMSO, Methanol, and ethanol) without being in need for heating.The obtained emulsion copolymers had high solid content and were used in emulsion paints as binder. The experimental results show that these polymers supply very useful properties such as high anticorrosive.The binder film are evaluated by measuring their chemical resistance. Thermal analysis of emulsion copolymers are conducted by using thermo Gravimetric analysis (TGA) and thermal differential calorimeter (DSC) techniques, which reveals that theemulsion acrylic polymers possess thermal stability.

KEYWORDS: *Binder, Coating, Emulsion Polymerization, Methylacrylicacid, Surfactants*

Article History

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