HTM P 2

Sinteza hibridnih vodorazredivih alkidnih smola

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U ovom radu ispitivan je uticaj dodatka nanočestica silicijum(IV)-oksida na svojstva hibridnih vodorazredivih alkidnih smola. Sinteza vodorazredivih alkidnih smola izvedena je reakcijom direktne poliesterifikacije glicerola, anhidrida ftalne kiseline i modifikovane ricinolne kiseline. Modifikacija ricinolne kiseline izvršena je reakcijom radikalske polimerizacije sa anhidridom maleinske kiseline. Sinteza hibridnih alkidnih smola izvedena je dodavanjem hidrofilnih nanočestica silicijum(IV)-oksida (1, 2 i 5 % na masu alkidne smole) u alkidnu disperziju i tretiranjem ultrazvukom u trajanju od 15 min, pre formiranja filma. Struktura dobijene modifikovane smole potvrđena je FTIR metodom. Za ispitivanje mehaničkih osobina, alkidni film je formiran umrežavanjem sa 2 % (po masi) stirena na 100 °C. Prema rezultatima dobijenim fizičko-mehaničkim ispitivanjima, dobijene alkidne smole su pogodne za različite primene kao premazi. Takođe, rezultati pokazuju da dobijene modifikovane alkidne smole imaju visok sjaj, pokazuju mogućnost dobre adhezije i da im se dodatkom nanočestica povećava tvrdoća, kao i otpornost na metil-etil-keton.

Synthesis of hybrid waterborne alkyd resins

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In this work, the influence of silica nanofiller on the properties of hybrid waterborne alkyd resins was investigated. Synthesis of water dispersible alkyd resins was carried out by direct polyesterification of glycerol, phthalic anhydride, and modified ricinoleic acid. Modification of ricinoleic acid was accomplished by free-radical polymerization of ricinoleic acid and maleic anhydride. The synthesis of hybrid alkyd resins was performed by addition of hydrophilic surface modified silica nanoparticles (1, 2 and 5 % based on alkyd resin weight) in the alkyd dispersion and sonication for 15 minutes. Structures of the obtained modified resins were confirmed by FTIR method. Mechanical properties were assessed for an alkyd film obtained by curing with 2 wt % of styrene at 100 °C. Based on the results of physical-mechanical testing, the obtained alkyds are suitable for various applications as coatings. These results indicate that the obtained films based on modified alkyd resins have a high gloss, good adhesion properties and that the addition of nanoparticles results in a higher value of hybrid film hardness and resistance to methyl ethyl ketone.

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