Name of scholar – Sarvat Zafar

Name of Supervisor – Prof.Sharif Ahmad

Department of Chemistry

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ABSTRACT

Vegetable oils have been identified as one of the potential resources for the development of green chemicals, which can act as a substitute for petrochemicals, whose depleting reserves are expected to exhaust by the end of twenty first century. Such a situation propels scientists/technologists and industrialists to develop the process and use the vegetable oils as an alternative resource for not just in the energy sectors but also for non energy industrial applications. Vegetable oils with special chemistry have been identified as a good source for the development of polymers; find application in the field of adhesives, inks, paints, coatings and printing processes. Amongst the various methods used for surface protection and decoration of metals, the use of organic coatings takes the privilege of covering around 85% of the metallic surfaces in the world either for corrosion protection, decoration or for both. The properties of coatings or paint films are determined by the types of binders, pigments and miscellaneous additives used in the formulation. These coatings containing very high level of solvents, more accurately volatile organic compounds (VOCs), play a major role in global warming (20-25%) and in photochemical ozone creation, which is toxic to plants and animals including humans. Due to the stringent/environmental pollution acts (EPA), the use of solvents emitting VOCs in commercial products has been reduced dramatically. To meet the requirements

of EPA, considerable efforts have been made by the paints and coatings industry to avoid the use of organic solvents (VOCs) in the development and formulation of coating materials. Numerous alternatives for solventborne coating systems have been developed to eliminate or/reduce VOC emissions from paints and coatings during the foregoing 50 years. Among these alternative coating systems, waterborne coatings [WBCs] system have attracted much attention in industry due to a number of advantages:

1. Low viscosity at high molecular mass and at high volume fraction of polymer.
2. Preparation process is simple and versatile.
3. Easy to be formulated to match different applications.
4. Using water as the continuous liquid phase is inexpensive and safe.
5. Clean up of equipment is easier.
6. Solventborne coatings have limitations of bloom, gelation, over coating, flammability, and harmful vapors (VOCs), while WBCs posses the advantages of good chemical resistance, toughness, durability, low cost, ecofriendly and non toxic in nature, are generally formulated with the polymers of high molecular weight and high transition temperature.

WBCs are classified into three types based on the nature of resin fluidity and solution i.e. water soluble, colloidal dispersions and water reducible. Utilization of sustainable resources, in the form of blends or composites of sustainable resource based polymers and petro-based polymers for the development of promising WBCs system, is thought to be an important approach to reduce or replace the traditional polymeric systems that involve the use of organic solvents and petro-based monomers which consume much energy and cause VOCs emissions.