

Technical Bulletin

JEFFSOL[®] ALKYLENE CARBONATES IN FIBERS AND TEXTILES

JEFFSOL[®] Ethylene and Propylene Carbonates are widely used in many phases of the fibers and textile industry. These applications include their uses as solvents, reactants, and plasticizers.

JEFFSOL Propylene Carbonate is a VOC Exempt solvent.

FIBER PRODUCTION

JEFFSOL Carbonates are used as solvents in the extrusion or polymerization into fibers of acrylonitrile and graft copolymers of acrylonitrile and other substances. The carbonates may be used alone or mixed with other solvents.

JEFFSOL Propylene Carbonate may be added to the reaction mixture during the manufacture of polyamides. The resultant fibers have greatly improved dyeability.

The JEFFSOL Carbonates undergo ester interchange reactions to prepare many different polyesters. A number of these polymers are fiber forming. Treatment of a monomethyl terephthalate with JEFFSOL Carbonates at 270 to 280°C gives a polyester that can be cold drawn into fibers. A linear polyester has been made from a mixture of a dicarboxylic acid, JEFFSOL Carbonate, and a molten linear polyester of low molecular weight by heating until the mixture becomes fiber forming. Polyesters have also been obtained by heating a mixture of JEFFSOL EC or JEFFSOL PC and a dibasic acid.

TEXTILE FINISHING

The solvent properties of JEFFSOL Carbonates are often employed in preparing synthetic and natural fabrics for specific uses.

If both JEFFSOL EC and JEFFSOL PC are used in fluorescent brightening processes for acrylic fibers, greater fabric lightfastness, strength, and brightness result.

Creasing and crimping of spun polyacrylonitrile fabric is enhanced by treatment with an aqueous solution of JEFFSOL EC. Protein-acrylonitrile graft copolymer fabric exhibits improved softness and elasticity if it is treated with JEFFSOL EC. Acrylonitrile-vinyl acetate copolymers show greater wear absorption and pilling resistance if JEFFSOL EC is applied.

Shedding, pilling, and matting of napped fabrics containing acrylic fibers can be prevented by applying an aqueous solution containing JEFFSOL EC. If a JEFFSOL EC-PC mixture and steam are applied in succession to acrylonitrile-polymer fabric, followed by pressing of the fabric between rollers, loose fiber ends will flatten and adhere to the fabric surface, producing a smooth, fuzz-free product.

JEFFSOL PC may be included in fluorocarbon resin finishing agents used to dirt-proof and oil-proof cotton fabric. Treatment of aminoethylated or partially carboxymethylated cotton fabrics with aqueous solutions containing JEFFSOL EC and JEFFSOL PC results in greater wrinkle resistance.

Acetate fiber blend fabric can be etched with pastes containing JEFFSOL Carbonates. The JEFFSOL Carbonates may also be used in fabric bleaching compounds to give improved whiteness and strength.

TEXTILE DYEING

Aqueous solutions of JEFFSOL Ethylene and Propylene Carbonate are excellent dye assistants for many synthetic fibers. The JEFFSOL Carbonates usually improve fiber dyeability by acting as solvents for the dye and by swelling the fibers to allow greater dye penetration.

JEFFSOL EC is one of the most effective plasticizing agents for dyeing acrylic fibers. Color uniformity in dyed acrylic fibers can be improved by pretreatment with JEFFSOL EC. Both JEFFSOL Carbonates may be utilized as dye assistants for polyacrylonitrile fabric, either by themselves or in conjunction with a nonionic surfactant.

The JEFFSOL Carbonates may also be employed as dye assistants for acetate fibers. JEFFSOL EC shortens dyeing times for triacetate fibers in disperse dyes.

Polyester fabric dyeability can be aided by treatment with JEFFSOL EC or JEFFSOL PC and a catalyst.

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