

Car wash Shampoo Formulations

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Abstract

rinse, and drying besides the manual cleaning of domestic vehicles. The objective of this work is to find chemical

Introduction

An international company in ON Canada is looking to improve chemical properties of their Car wash shampoo. A liter of carwash shampoo concentrate dilutes only to 200L using the current formulation. The formulation consists of the following chemical compounds: 5% Linear Alkyl Benzene Sulphonic Acid (LABSA), 20% Sodium Lauryl Ether Sulphate (SLES), 5% Sodium Lauryl Sulphate (SLS), 1% Sodium Hydroxide, 2% Betaine, 61.5% Water, 3% Sodium triphosphate, 2% Glycerol, and 0.5% Propylene Glycol [1].

Car maintenance products are classified into interior and exterior car care products. Interior car care products are deodorants, grease cleaners, vinyl and plastic cleaners and polishes, interior window cleaners, carpet shampoos, and leather polishes. Interior car care products include, tyre dressings and cleaners, pre-soak detergents, car polishes, wash and wax formulations, windscreen cleaners, water repellents and drying aids, and wheel rim cleaners. The climate and the season of the year affect the nature of the soiling of the vehicle and the ease of its removal [2].

The bodywork of the automobile is composed of multiple coatings; each coating provides a variety of functions. (Figure 1) shows the

coating layers in the bodywork of modern cars. The paintwork of the vehicle is the external surface to be cleaned.

The base coat is usually water based polymeric binders, fillers, and pigments. The inner coating, the electro-deposition paint and the phosphate based anti-corrosion layer provide protection to the metal surface. On top of the protective coatings is the filler layer, it must have an excellent adhesion property to both top-coat and the base coat. The finishing lacquer must have good impact strength, retain gloss, and it must be waterproof. Domestic and industrial automated cleaning of vehicles can be divided into four main steps, pre-wash, main wash, rinse, and drying besides the manual cleaning of domestic vehicles. Pre-wash includes cold degreaser, microemulsion, and foam wash. Main wash includes shampoo, and microemulsion. Rinse includes hot/cold wax and rinse aid [3].

Car shampoos can be either in liquid or in powder form. Liquid car shampoos are a combination of binders, surfactants and liquids dissolved in water as the main solvent. These products are easily rinsed off, high foaming, biodegradable, made to cut through grease on the bodywork, and they don't damage any part of vehicle surface including the paintwork. Economy car shampoos do not contain builders. Powder car shampoos are made of a mixture of builders

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foam is required. Fatty acid alkanolamides, amine oxide or betaine are used in the formulation for viscosity and to stabilize the foam produced. For greater foam stability and viscosity, amides are added to the formulation. To increase the quantity of the foam produced, betaines and amine oxides are used. Glycerol ether are used to ease grease removal. Secondary surfactants are used for viscosity and foam modifications, and are also used to enhance spot removal, and to improve detergency. Binders such as phosphates (0.5-2.5%) are added to improve detergency [4]. Low hydrophilic lipophilic balance (HLB) fatty alcohol ethoxylate/ hydrotropic system replaced the traditional anionic surfactant-based car shampoo as they afford more effective cleaning performance, decreasing and they have low foam profile [5].

Sodium citrate is known to be a water softener and a PH adjuster. It's an ingredient in most common liquid detergents. It's also used in some food products to adjust its acidity. It's used in ice cream, gelatin

temperature and has a faintly sweet taste. It's miscible in a wide variety of solvents including chloroform, acetone, and water. It's a non-irritating substance with a low volatility. It's used in various industries including food and drug, anti-freezes, polymers, and electronic cigarettes. It's used as a humectant in hand sanitizers to prevent skin drying [13]. It's used in coffee-based drinks, ice creams, whipped dairy products, soda, and liquid sweeteners. Polypropylene glycol alginate gives rise to greater increase in form stability equal

The current formulation consists of 1% builder in the form of sodium hydroxide, 3% water softener in the form of sodium triphosphate, 32% surfactants in forms of 5% Linear Alkyl Benzene Sulphonic Acid, 20% Sodium Lauryl Ether Sulphate and 5% Sodium Lauryl Sulphate, and 2.5% solvents in forms of 0.5% Propylene Glycol and 2% Glycerol.

Sodium and potassium hydroxides are known to be used in wheel rim cleaner formulation as the alloy wheel pick up dirt and grease from the road and they are prone to dirt from the abrasive wear of brake shoes. The amount of sodium and potassium hydroxides used in the wheel rim cleaner formulation 0-15%. It isn't known to be used in carwash formulations. Other builders are known to be used in car wash formulations to soothe out slight imperfections and to remove road grease and stubborn tar from the bodywork of the vehicle. These builders would be calcium carbonate, silicones, and lamella aluminum silicates. To increase the quality of car wash shampoo formulation silicone derivative builders are added as to the formulation. Silicone derivative builders contribute to the ease of application of the products, the gloss and its water repellency property.

The amount of surfactant used in the current car wash shampoo formulation concentrate is 32% (5% Linear Alkyl Benzene Sulphonic Acid, 20% Sodium Lauryl Ether Sulphate, 5% Sodium Lauryl Sulphate, and 2% Betaine). To increase the quality of the car wash shampoo, the amount of surfactants in the formulation must be increased to 37%.

Citation:

impact of various dietary patterns combined with diferent food production