

Abstract

Hydrofluoric acid (HF) is a common ingredient in car wash cleaning solutions mainly because it is highly effective and relatively inexpensive. Particulate matter from brake pads and discs, tire wear, and abrasion of road surface accumulated on the exterior of automobiles are aggressively removed with the use of car wash cleaning solutions containing HF. The unique properties of HF to dissolve silica, concrete, most metals, and metallic oxides cause effective breakdown of rust, road dust, and grime on automobiles. However, HF is a very caustic and a highly toxic substance. Due to hazards associated with the storage, use, and exposure of HF to humans and the environment, there is a need to find safe, yet equally effective alternatives to HF as a cleaning agent. Improvements in cleaning processes, development of available technologies, and utilization of cleaning products containing natural and various benign polymers and surfactants are healthy and environmentally sound alternatives to HF for car wash applications. However, these alternatives may not be as effective as HF. Efforts geared towards finding a replacement for HF remain a challenge, but the outcome would render several benefits to the car wash industry, including abating pollution and providing a safer working environment for everyone.