

How an Aerosol Can Works

Student Essay

At one time or another, most of us have probably used an aerosol can. With just a push of the button, we easily and quickly apply just the right amount of furniture polish, bathtub cleanser, or underarm deodorant. It is obvious to us that the aerosol can is more convenient than the old-fashioned jars of liquid polish or cans of powdered cleanser, which can spill or be applied too thickly. At the same time, however, most of us probably do not know how the aerosol can works. We accept its ease and convenience without realizing that the aerosol can is quite a complex container.

An aerosol is not a simple cleaner or polish; it is a colloidal system. That means it consists of finely divided liquid or solid particles, called a product, dispersed in and surrounded by a gas. The most commonly used gases, or propellants, are chlorinated hydrocarbons, butane, propane, isobutane, vinyl chloride, and nitrogen. Nitrogen is used particularly for products when the taste or smell of the propellant is not desired in the product, for example, in toothpaste or whipped cream.

To complicate things further, the propellant, or gas, is present in either a liquid or a gaseous state. If the propellant is liquid, it is mixed with the product in the form of a solution. An example of this type of aerosol is hair spray. The spray or lacquer is usually dissolved in alcohol and then completely mixed with the propellant. If the propellant is present in a gaseous state, the container usually is about half-filled with the product and half-filled with a propellant such as nitrogen. The propellant gas forms a separate layer over the product. Aerosol toothpaste is a good example of this type of aerosol. The contents of the can, then, are either a product-propellant solution or a layer of product topped by a layer of propellant. In both cases, the propellant gas is not simply put in a jar but is forced into the can under high pressure, about 90-120 pounds per square inch.

The releasing mechanism for an aerosol can is also complicated. All aerosol cans are fitted with a valve and a siphon tube, which allow for the release of the product. The valve is either a spray valve or a foam valve, depending on the contents of the can. The valve is force-fitted into the neck of the dispenser under high pressure (about 3/4 tons), so that a strong, gas-tight seal is formed. This prevents the propellant in the can from escaping. The valve is connected to a siphon tube, which hangs down inside the can to the bottom of the can. When the valve button is pressed, the propellant vaporizes immediately, and its pressure forces the liquid through the siphon tube and out the nozzle. The liquid comes out of the can in the form of a mist or foam.

What appears to be a simple push of a button, then, is really a complex accomplishment of modern

physics and chemistry. The insect repellent that sprays a fine mist neatly and quickly was not simply poured into a bottle; it was packaged very carefully, with specific and complicated equipment. The next time we pick up a familiar aerosol can and wonder how it works, we should remember that the ease and convenience it gives us is the result of someone or someone else doing a lot of work.