Rocket Fuels Are Popular Beverages of Americans

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Cape Canaveral–(UPI)–Rocket fuels are America's most popular beverages.

For instasnce, that glass of water you had this morning contained the two propellants that will power the free world's first high-energy space rocket starting next year.

If the water in your area is fluoridated, you consumed a third fuel that has possibilities for rocket engines – as soon as scientists can figure out how to stop it from eating through metal.

And if, by this time, you have seasoned the water with bourbon or scotch, your stomach is lined with a propellant scientists are counting on to lift a man to the edge of space within a few months.

Don't Worry

Don't start worrying about your inner plumbing. Water, as such, will do no more for a rocket motor than it would in your car's gasoline tank. And the best bourbon on the market won't lift a missile one inch from its pad.

But to a missile scientist–a veritable modern-day alchemist–these everyday items hold the key to propulsion systems he will use to challenge Russia in the space race. It makes changing lead into gold seem a second-rate trick.

Nearly every school kid who has taken chemistry has seen water–the familiar H2O –changed into its two elements, hydrogen and oxygen, by electrolysis. Scientists can take this one step further, by compressing the gases.

The results are liquid hydrogen and liquid oxygen–intensely cold at hundreds of degrees below zero, difficult to handle. But they are now the substances that scientists of Convair Division of General Dynamics Corp. predict "will open the entire inner solar system to research."

Liquid hydrogen and oxygen will be used for the first time together in the Convair-built Centaur rocket, a high-energy vehicle which will be available in 1961 to give America a means of matching Russia pound for pound in ability to throw payloads into space.

Centaur, generally considered this nation's next big step in rocketry, will be able to place 4½-ton satellites into orbit when launched aboard an Atlas missile. It also will ride atop the Saturn "super-booster" to loft payloads of 20 tons or better.

Rely on Liquids

Centaur is a firm indication that, despite considerable advances in solid fuels, U.S. scientists will be relying on liquid propellants for years to come to give men and machinery their big shoves toward the moon and planets.

Liquid-fueled rockets are highly complex–in fact, the hydrogen-oxygen Centaur was years in arriving because scientists had to devise an engine capable of using the highly volatile propellants. Pratt and Whitney Aircraft finally accomplished it.

But the all-important burning time can be controlled in liquid-fueled engines simply by electronically shutting off a valve. Solid-propelled rockets, which almost amount to overgrown and elaborated roman candles, are considerably more difficult to control.

Liquid fuels were made popular in the German V-2 rockets, and were extended into one of America's first ballistic missiles, the Army's Redstone. This rocket is powered by liquid oxygen and alcohol–a variation of the substance which puts the "kick" in liquor.

Proved Reliable

The oxygen-alcohol combination has proved so reliable that the Redstone will be the first ballistic missile to carry an American astronaut–a 14-minute hop 100 miles up and 200 miles over the Atlantic sometime next year.

Liquid oxygen, which actually serves as an oxidizer to allow other fuels to burn in airless space, will be used in the Saturn 1.5 million-pound thrust engine with a high-grade kerosene.

Beyond Saturn is Nova, a rocket monster which will have a thrust of 9,000,000 pounds. Its fuel also will be liquid–probably liquid oxygen and kerosene.

Scientists are constantly searching for "exotic" fuels for increased propulsion. The liquid hydrogen-oxygen combination is the most potent scheduled for actual use, but considerable thought has been given to the "ultimate" liquid fuel mixture – hydrogen and fluorine.

Fluorine Used

Fluorine is an element which, when used in extremely small amounts, has been employed safely in combatting tooth decay. But liquid fluorine will eat through almost anything except certain kinds of wax and is a terrifying substance to handle.

At least one firm, Boeing Aircraft Co., reportedly has devised a propellant system based on hydrogen and fluorine. The plan is contained in a study called "The Ultimate Chemical Propellant," but has been kept under wraps.

Meanwhile, scientists are at work on other propulsion systems that will give man the power he needs to conquer space–and they are not inclined toward being unable to see the forest for the trees.

The fuel for the next generation of U.S. super rockets may be, like that innocent glass of water, something you take for granted every day.

Heavy Shielding Is Unnecessary

Washington, (Science Service)—Heavy shielding as protection for an astronaut against space radiations may not be necessary, at least for trips of less than 50 hours and at distances not greater than 618 miles from earth, the Air Force School of Aviation Medicine at Brooks Air Force base, Texas, has announced.

Lightweight aluminum provides acceptable shielding and, in fact, heavy shielding, such as lead or gold, would be more harmful than no shielding at all, Dr. George W. Crawford, nuclear physicist of the school's department of radiobiology, reported. (Other recent reports show that living organisms are killed at heights of 1,180 miles.)

Crawford's findings were based on examination of the biological specimens encased in a three-pound aluminum capsule as part of the payload of Discoverer XVIII satellite launched in November. The specimens spent 50 hours in orbit during a gigantic solar flare. The satellite whirled about the earth 31 times before it was returned and recovered in the earth's atmosphere in the air near Hawaii by a USAF C-119 aircraft.

Lethal Dose

Previous estimates by scientists of radiation levels had indicated that solar flares might be of such intensity as to deliver a lethal dose to astronauts unless protected by heavy shielding.

"Our specimens received not more than 32 to 35 rads during the 50 hours they were in space," Crawford said. "They were in space during one of the largest solar flares ever recorded and were exposed to radiation from the flare for 50 hours, starting just seven hours after the flare began."

This is the first time such specimens from this country were exposed to such intensities and concentrations of radiation for an extended time at such an altitude and recovered for analysis.

The biological specimens were encased in different types of metal to test their effectiveness as shielding materials. Other specimens were shielded only by the thin aluminum covering of the specimen capsule and the comparatively thin shell of the recovery capsule. Radiation dosimeters showed that aluminum provided better shielding properties than lead and that any heavy metal such as gold or lead becomes a hazard during a solar flare as high energy protons interact with these heavy metals to create damaging X-rays, Crawford explained. This does not occur with the lighter metals or plastics.

Bacterial spores sent along with the human tissue verified radiation measurements in the vehicle and the spores were not harmed. Specimens of algae, a possible space food and a plant useful for atmosphere regeneration in the confines of a space capsule environment also appeared to be unaffected by radiation exposure in their orbit in Discoverer XVII.

Samples of human eye and bone joint tissue were aboard. Human eye tissue is the most sensitive of all to radiation and the samples were sent aloft to determine whether they would survive. Analysis has shown that the cells were not affected by the radiation and a sample portion now is reproducing normally.

Human blood cells, also along for the space ride, were not damaged.

These findings would indicate that space radiation may not be the major hazard to space flight as previously believed.

Better Mouse Trap Finally Invented

Washington (Science Service) – Inventors are still trying to come up with a better mouse trap, and the newest innovation, patented recently, uses the fly paper principle.

Patent No. 2,962,836 was awarded to Samuel T. Hughes of Cullman, Ala., for a rodent-catching device that has the appearance of a flat-roofed bird house. A rectangular hood with round entry holes in either end fits over a pad of sticky papers. The bait is placed in a small bucket mounted inside one corner of the hood.

When a mouse ventures into the building, it is trapped on the adhesive floor. A particular advantage of the trap is that the top piece of sticky paper can be peeled off and wrapped around the trapped mouse without ever handling it.