

## FOURTH OF JULY FIREWORKS DEPEND UPON MINERALS

As the nation gets ready to celebrate the 214th anniversary of its Declaration of Independence on July 4th, take a moment to consider the minerals that make fireworks such a spectacular part of the festivities, suggests the Interior Department's Bureau of Mines. Each color in a fireworks display is produced by a specific mineral compound:

- Bright greens are made with barium.
- Deep reds are a product of strontium.
- Blues come from copper.
- Yellows require sodium.

More colors can be created by mixing compounds. Strontium and sodium together produce a brilliant orange. Titanium, zirconium, and magnesium alloys combine to make a silvery white. Copper and strontium mix to yield a lavender.

Certain minerals are used for special effects. Iron filings and small particles of charcoal produce gold sparks. If you want a loud flash, fine aluminum powder is the fuel to choose. Larger particles, such as small flakes or granules, give a longer, shower-like effect. Magnalium, a magnesium-aluminum alloy, can produce a tiny series of silvery-white flashes. Aluminum, antimony sulfide, and perchlorate are some flash mixtures.

Although fireworks date back to ancient China, they continue to grow in popularity. Just in the past decade, their use has doubled to nearly 30,000 shorts tons per year. Of this amount, consumers buy two-thirds. The remainder go for fireworks displays. About 85 percent of consumer fireworks and half of the display variety are imported from China, Japan, Korea, and such European countries as France and Italy.

The role of minerals in fireworks is just one example of society's growing reliance upon minerals for the manufacture of everything from automobiles to toothpaste. During the lifetime of the average American, he or she will use:

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| • 3,600 lbs. of aluminum | • 1,500 lbs. of copper                                     |
| • 730 lbs. of zinc       | • 25,000 lbs. of salt                                      |
| • 27,000 lbs. of clay    | • Nearly 1,000,000 lbs. of stone, sand, gravel, and cement |
| • 35,000 lbs. of iron    |  |
| • 800 lbs. of lead       |  |

"As you can clearly see," says Bureau of Mines Director T.S. Ary, "our onal independence relies on minerals dependence."

*The above information is a reproduction of a U.S. Bureau of Mines, Office of ublic Information handout which was originally produced on June 7, 1990 by David Barna.*

