

FOURTH OF JULY FIREWORKS DEPEND UPON MINERALS

As the nation gets ready to celebrate the 214th anniversary of its Declaration of Independence on July 4, 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 short 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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| <input type="radio"/> 3,600 pounds of aluminum | <input type="radio"/> 800 pounds of lead |
| <input type="radio"/> 730 pounds of zinc | <input type="radio"/> 1,500 pounds of copper |
| <input type="radio"/> 27,000 pounds of clay | <input type="radio"/> 25,000 pounds of salt |
| <input type="radio"/> 35,000 pounds of iron | <input type="radio"/> nearly 1 million pounds of stone, sand, gravel, and cement |

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

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