

What's In A Hybrid Car?



- Bauxite (aluminum). Mined in Australia, China, Brazil, India, Guinea, Jamaica, Russia, Venezuela, Suriname, Kazakhstan, Guyana and Greece.
- Cadmium (batteries). Mined in China, Republic of Korea, Japan, Kazakhstan, Mexico, Canada, Russia, United States, India, Netherlands, Poland, Germany and Australia.
- Chromite (chromium). Mined in South Africa, India and Kazakhstan.
- Coal (by-product coke is used to make steel). Coal is mined world-wide, and constitutes 30.1% of the generation of U.S. electricity.
- Cobalt (alloy; batteries). Mined in Congo- Kinshasa, Canada, Zambia, Russia, Australia, China, Cuba, Morocco, New Caledonia and Brazil.
- Copper (wiring). Mined in Chile, United States, Peru, China, Australia, Russia, Indonesia, Canada, Zambia, Poland and Mexico.
- Gold (circuitry). Mined in China, United States, Australia, South Africa, Peru, Canada, Uzbekistan, Ghana, Papua New Guinea, Indonesia, Brazil, Mexico and Chile.
- Iron ore (steel). Mined in China, Brazil, Australia, India, Russia, Ukraine, United States, South Africa, Iran, Canada, Sweden, Kazakhstan, Venezuela and Mexico.
- Lead (batteries). Mined in China, Australia, United States, Peru, Mexico, Canada, India, Bolivia, Poland, Russia, Sweden, Ireland and South Africa.
- Lithium (batteries). Mined in Chile, Australia, China, Argentina, Portugal, Zimbabwe and Brazil.
- Manganese (steel alloy). Mined in South Africa, Australia, China, Gabon, Brazil, India, Ukraine and Mexico.
- Molybdenum (steel alloy). Mined in China, United States, Chile, Peru, Mexico, Canada, Armenia, Iran, Russia and Mongolia.
- Nickel (batteries; alloy). Mined in Russia, Canada, Australia, Indonesia, New Caledonia, Philippines, Columbia, China, Cuba, Brazil, Botswana, South Africa, Dominican Republic, Greece, Venezuela and Spain.
- Platinum (circuitry). Mined in South Africa, Russia, Canada, Zimbabwe, United States and Columbia.
- Rare Earth Oxides - Lanthanum (batteries), Neodymium (electric motors). Mined in China, India and Brazil.
- Silica (silicon). Mined in United States, Italy, Germany, United Kingdom, Australia, France, Spain, Japan, Poland, Hungary, South Africa, Mexico, Austria, Iran, Republic of Korea, Slovakia, Canada, Belgium, India, Bulgaria, Norway, Chile, Gambia, Turkey and Czech Republic.
- Sulfur (chemical solutions). Mined in United States, Canada, China, Russia, Japan, Saudi Arabia, Kazakhstan, Germany, United Arab Emirates, Republic of Korea, Mexico, Chile, Iran, France, Poland, India, Australia, Italy, Kuwait, Finland, Spain, South Africa, Netherlands and Uzbekistan.
- Tungsten (wiring). Mined in China, Russia, Canada, Austria, Bolivia and Portugal.
- Vanadium (alloy). Mined in China, South Africa and Russia.
- Zinc (galvanizing). Mined in China, Peru, Australia, United States, Canada, India, Kazakhstan, Ireland and Mexico.

SOURCES

Researcher: Michele Wiechman, Colorado School of Mines
Edited by the US Geological Survey 2010

Sources:

http://www.energizerresources.com/_resources/Vanadium-The_battery_growth_story-website.pdf

Dictionary.com

U.S. Geological Survey 2010 Mineral Commodity Summaries,
<http://minerals.usgs.gov/minerals/pubs/mcs/2010/mcs2010.pdf>

<http://www.molycorp.com/default.asp>

U.S. Energy Information Administration. 2018 Frequently Asked Questions.

<https://www.eia.gov/tools/faqs/faq.php?id=427&t=3>.

INTERESTING FACTS

- Hybrid cars use twice as much copper as non-hybrid cars.
- The U.S. possess the largest non-China rare earth resource in the world at the Mountain Pass Mine, located in California.
- The glass in vehicle windows contains trona and feldspar.
- Carpeting contains boron and limestone.
- Steel-belted tires contain mica, sulfur, beryllium, cobalt, and zinc and copper (brass).
- The majority of lead consumed in the United States is produced from recycled lead-acid batteries.
- The recycling rate of lead contained in lead-acid batteries in the United States is estimated to be about 96%.
- Lead-acid batteries are used in most micro-hybrid vehicles that have automatic stop-start functionality to cut engine power when the vehicle is idling.
- New designs that significantly improve the performance of lead-acid batteries are being tested for future use in hybrid electric vehicles.
- Primary cadmium metal is recovered as a byproduct of zinc leaching from roasted concentrates, mainly from the ore mineral sphalerite. Secondary cadmium metal is recovered from spent nickel-cadmium batteries and other cadmium bearing scrap metal.
- China supplies 97% of the world's supply of rare earths, which are used in a variety of products.
- A multitude of petroleum products are used in hybrid cars.