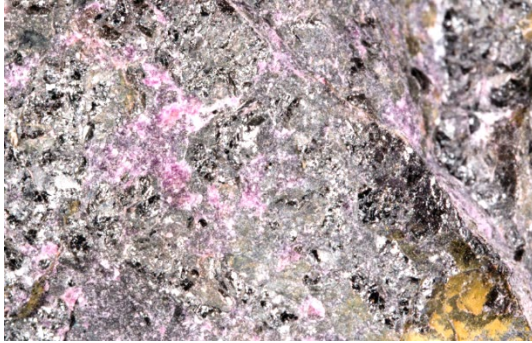




## 20. Chromite ( $\text{FeCr}_2\text{O}_4$ )



Chromite is the only mineral containing chromium that is common enough to be mined. Chromium is an important economic mineral that is in common use around the world, such as an additive in making steel to give it resistance to corrosion. Stainless steel contains at least 10.5% chromium. It is also used as a plating on steel to prevent rust and gives it a very shiny, mirror-like finish. Most of the world's production of chromium is from South Africa, Turkey, and Kazakhstan. The USA must import almost all its chromium because it has no

chromite concentrations large enough to mine.

### Activities:

**K-1:** Look around your home or school for items that you think are made with stainless steel. If they are not coated or painted, they probably have a shiny silver color that looks like aluminum foil. Kitchen appliances such as refrigerators, ovens, dishwashers, and toasters or toaster ovens are likely made out of stainless steel that has chromium in it so they won't rust easily. Check whether you correctly identified steel items by applying a refrigerator magnet to them—most stainless steel is magnetic (unless it has a high content of the metal nickel) and will attract the magnet, even if the steel is coated or painted. Draw some of the things you found that are made from steel:

**K-3:** Chrome-coated steel and stainless steel containing chromium are much heavier than aluminum or plastic. Apply a refrigerator magnet to your flatware (knives, forks, and spoons) to see if they are magnetic, which indicates they are made with stainless steel. Find a plastic fork or spoon and hold it in one hand. Hold a similar-size stainless steel fork or spoon in your other hand. Circle which is heavier of the same-size utensils:



## 20. Chromite continued



Plastic utensil



Stainless steel utensil

**4-5:** Chromium is very hard at 8.5 on the Mohs hardness scale from 1 to 10. Steel is about 6.5. What advantage would be provided by coating drill bits with chrome? \_\_\_\_\_

\_\_\_\_\_.

**6+:** For many years, the impact-absorbing bumpers on cars were chrome-plated steel for both function and style. Starting in the 1970s, automobile manufacturers began replacing chrome bumpers with plastic covers over steel or aluminum bumper bars to reduce vehicle weight and thus improve fuel economy. If the two chrome steel bumpers on a car weigh 68 kg each and are replaced with aluminum-construction bumpers that weigh 9 kg each, how much weight is saved: \_\_\_\_\_.

The average car weighs 1,800 kg. What percentage of the weight was saved by replacing the bumpers: \_\_\_\_\_.

The US EPA says that for every 45 kg a vehicle's weight is reduced, the fuel economy is increased by about 1.5%. How much was the fuel economy improved by replacing the bumpers: \_\_\_\_\_.