

**THINKING CRITICALLY****● Gathering Ocean Resources**

Many ocean-floor sediments contain chemical deposits such as nodules. Nodules are irregularly shaped lumps of minerals that form during chemical reactions in the ocean and then settle to the ocean floor, usually on the abyssal plains. Nodules are generally made of oxides of certain metals, most notably manganese, iron, and nickel. Manganese and iron make up the largest percentage of these nodules, and smaller concentrations of nickel, copper, zinc, and cobalt can also be found in these nodules. Manganese is the primary metal derived from nodules, although significant amounts of other metals can be extracted. While nodules may represent a concentrated resource of some metals required by industry, the retrieval of the nodules from the ocean floor is costly and difficult. There is also some controversy about which country would own the mineral rights to ocean-floor sediments that are located in international waters.

1. Given their composition, why are the oxide deposits in the Pacific Ocean called manganese nodules instead of iron nodules?
2. Why aren't the nodules regularly collected and used as a source of manganese?
3. If large quantities of gold or silver were found in the nodules, would the collection of nodules be more likely? Explain your answer.