

METALS IN THE SERVICE OF MAN

Let us consider why metals play such a great role in man's activities. Wood and stone are both older in use, yet to a considerable extent they have been replaced by metals. In spite of the great progress of chemistry and increasing output of plastic materials metals are still used for most of machines, structures and instruments. If there were no metals, no railway, airplane, car, electric motor, turbine or pipeline could operate.

The reason for the increased use of metals is to be found in their characteristic properties. The most important of these properties is their strength or ability to support weight without bending or breaking. Resistance to atmospheric destruction, plasticity and the ability to be formed into desired shapes are remarkable as well. Some metals have also special properties – two of which are the ability to conduct electric current and the ability to be magnetized.

Nowadays we know that over three quarters of existing elements are metals. We know approximately over 80 metals and several thousand alloys. Most metals are usually found in nature as minerals or ores, where they exist in chemical combinations with other substances. Metallic ores contain metals combined with oxygen, sulphur or other metals.

Ores are usually mined and passed to the metallurgist for refining and purification. The ores are treated by fire or chemically by the process called smelting. Ores have to pass through this very complicated process before pure metals are obtained.

But pure metals are comparatively seldom used because they are rather expensive and their strength is generally insufficient for the purposes of to-day. The most important way in which the strength of metals can be increased is alloying. Alloys are the most important engineering materials. Alloys are obtained by adding various metals or non-metals to the main metallic element.