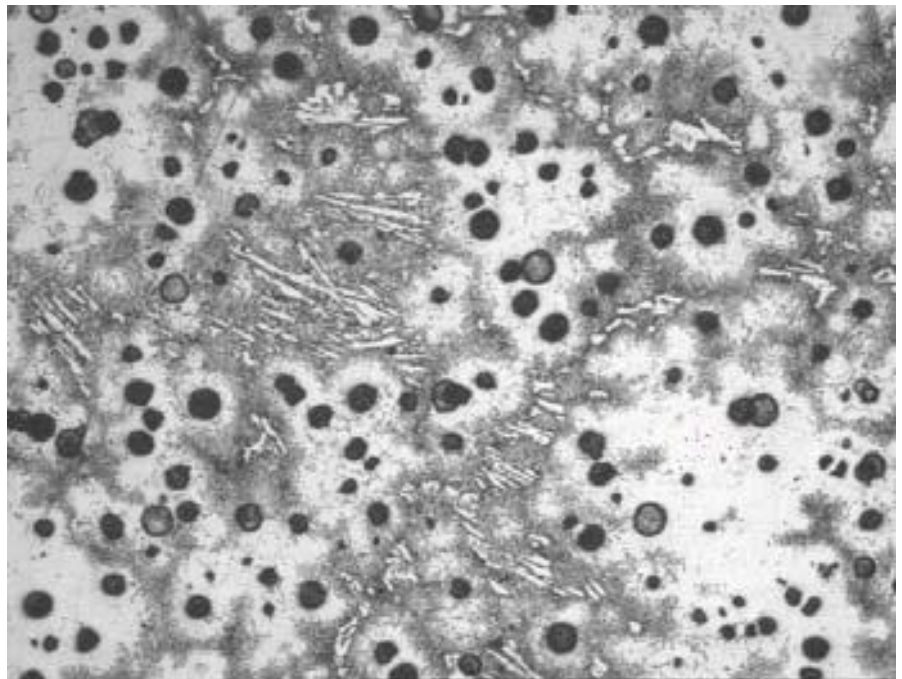


Carbides by Thermal Analysis

Carbides are not everyone's problem. Many types of iron have insignificant levels of carbides. But some grades of irons, especially pipe iron commonly do have carbide problems. The picture below shows both pro-eutectic and some post eutectic iron carbides. In addition steels and other high metals show multiple carbides such as molybdenum carbide, vanadium carbide, and chromium carbides in various forms. Most thermal analysis methods can detect these carbides and give the temperatures at which they form, but the more sophisticated forms of analysis can also measure the amount of energy of these arrests and estimate, with good accuracy, the percent of such carbides in the metal.

Iron Carbides:

In the example to the right you can see long needles of carbide. These are the pre-eutectic carbides that grew between the austenite dendrites when there was both an enriched carbon liquid, and space for the larger carbides to grow. Some smaller blocky carbides are visible separated from the longer needles. These are the post eutectic carbides that only grew in the grain boundaries as the eutectic was finishing up and there were only small volumes of liquid left.



The thermal analysis curve to the right shows these carbide arrests plainly in the second derivative. The single arrow to the left is the pre-eutectic while the three arrows to the right are small post eutectic carbide arrests.

