

## Natural Graphite

### Introduction to Natural Graphite

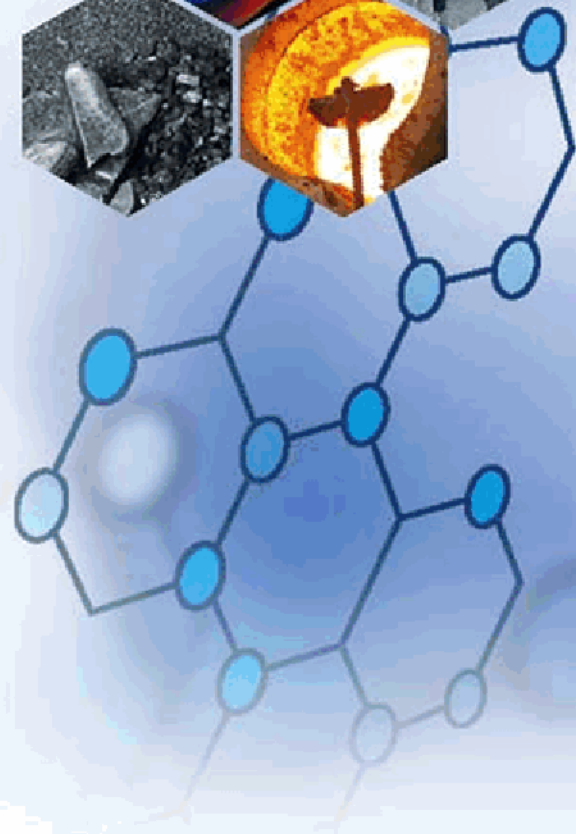
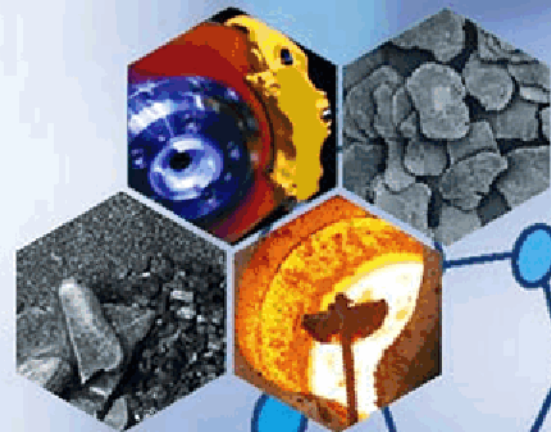
Natural graphite is graphite that is formed by Nature. Natural graphite is an important industrial mineral which finds applications in almost every facet of manufacturing including electronics, atomic energy, hot metal processing, friction, coatings, aerospace, powder metallurgy, etc. However not every form of natural graphite is suitable for every application to which natural graphite is applied. Differences in bulk and particle morphology, purity, and constraints on processing (grinding, screening, etc) make certain varieties more suitable for certain applications than others. The following sections of this article will describe the three types of natural graphite from a mineralogical and industrial point of view with the goal of providing users and potential users of these materials a basic understanding of the characteristics that distinguish each type of natural graphite from one another.

Natural graphite is generally classified into three types know as **flake** graphite, **vein** graphite, and **amorphous** graphite. These three types of natural graphite occur in distinct geologic environments. In addition to the comments directly below, these types and their corresponding petrological associations will be discussed in more detail elsewhere in this Web page.

#### Descriptive Mineralogy:

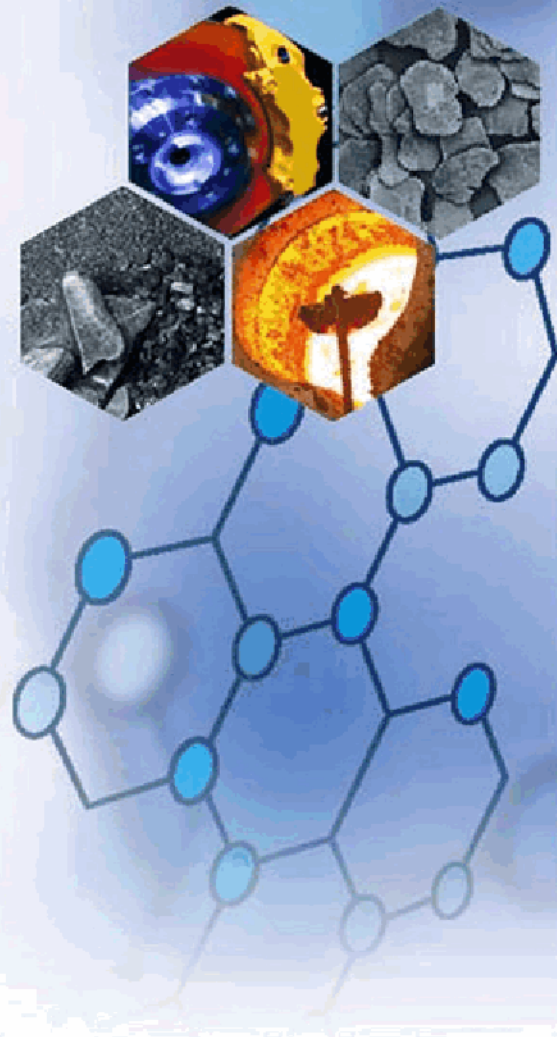
Graphite is a hexagonal mineral and crystallizes in the  $6/m2/m2/m$  crystal class. Common forms (crystal faces) include the {0001} basal pinacoid, {1010} prism, and {1011} pyramid. Graphite has perfect cleavage parallel to {0001} (perfect basal cleavage). The calculated crystallographic density of graphite is 2.26g/cc.

Depending upon the purity the measured specific gravity is approximately 2.20 to 2.30. Graphite containing higher levels of ash tends to show higher density due to the fact that most ash constituents have a specific gravity greater than 2.26. Natural graphite which has a density less than theoretical typically contains trapped porosity. Graphite is gray to black in color, is opaque to visible light even in thin section, and has a metallic luster. It is soft, with a Mohs hardness of 1-2 (Mohs 1=talc, Mohs 2 = gypsum, Mohs 10= diamond), is flexible, not elastic, and is sectile. Graphite has high thermal and electrical conductivity, is highly refractory (infusible in blowpipe), and chemically inert.

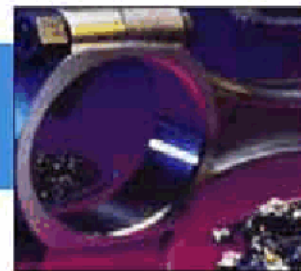


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<b>NATURAL</b>		
PM 5	5 Micron	95.5
PM 9	9 Micron	95.5
PM 13	11 Micron	95.5
PM 19	19 Micron	95.5
1651	9 Micron	95.5
1645	18 Micron	95.5
HPPM 5	5 Micron	99.0
HPPM 9	9 Micron	99.0
HPPM 19	19 Micron	99.0
<b>SYNTHETIC</b>		
PMA 5	5 Micron	99.0
4801	8 Micron	99.0
4439	20 Micron	99.0

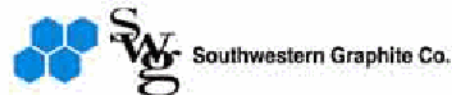
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