Coal

Coal is not a mineral, because it can not be expressed as a chemical formula, and therefore, does not have a definate crystaline structure. Coal is predominately carbon. The specimen in the photo is Bituminous Coal, with a carbon content of about 90%, and a BTU rating of over 13,000 BTU/pound. Even though it is predominately carbon the other constituents of coal can be almost anything that was in the swamp when it was formed. I put it in the mineral section because numerous questions have been forwarded to this site asking why coal is not a mineral.

The carbon content of coal ranges from 40% for low ranked coal (lignite) to about 98% for Anthracite Coal. [*1a*.]

Coal is a combustible black or brownish-black sedimentary rock normally occurring in rock strata in *layers or veins* called coal beds or coal seams. The harder forms, such as anthracite coal, can be regarded as metamorphic rock because of later exposure to elevated temperature and pressure. Coal is composed primarily of carbon along with variable quantities of other elements, chiefly sulfur, hydrogen, oxygen and nitrogen.

Coal begins as layers of plant matter accumulate at the bottom of a body of water. For the process to continue the plant matter must be protected from biodegradation and oxidization, usually by mud or acidic water. The wide shallow seas of the Carboniferous period provided such conditions. This trapped atmospheric carbon in the ground in immense peat bogs that eventually were covered over and deeply buried by sediments under which they metamorphosed into coal. Over time, the chemical and physical properties of the plant remains (believed to mainly have been fern-like species antedating more modern plant and tree species) were changed by geological action to create a solid material.

Coal, a fossil fuel, is the largest source of energy for the generation of electricity worldwide, as well as one of the largest worldwide anthropogenic sources of carbon dioxide releases. Gross carbon dioxide emissions from coal usage are slightly more than those from petroleum and about double the amount from natural gas.[1] Coal is extracted from the ground by mining, either underground by shaft mining through the seams or in open pits.

Types of coal:
As geological processes apply pressure to dead biotic material over time, under suitable conditions it is transformed successively into

- *Peat*, considered to be a precursor of coal, has industrial importance as a fuel in some regions, for example, Ireland and Finland. In its dehydrated form, peat is a highly effective absorbent for fuel and oil spills on land and water
- *Lignite*, also referred to as brown coal, is the lowest rank of coal and used almost exclusively as fuel for electric power generation. Jet is a compact form of lignite that is sometimes polished and has been used as an ornamental stone since the Iron Age

- *Sub-bituminous coal*, whose properties range from those of lignite to those of bituminous coal are used primarily as fuel for steam-electric power generation. Additionally, it is an important source of light aromatic hydrocarbons for the chemical synthesis industry.
- *Bituminous coal*, dense sedimentary rock, black but sometimes dark brown, often with well-defined bands of bright and dull material, used primarily as fuel in steam-electric power generation, with substantial quantities also used for heat and power applications in manufacturing and to make coke
- *Steam coal* is a grade between bituminous coal and anthracite, once widely used as a fuel for steam locomotives. In this specialized use it is sometimes known as *sea-coal* in the U.S.[2] Small steam coal (*dry small steam nuts* or DSSN) was used as a fuel for domestic water heating
- *Anthracite*, the highest rank; a harder, glossy, black coal used primarily for residential and commercial space heating. It may be divided further into metamorphically altered bituminous coal and *petrified oil*, as from the deposits in Pennsylvania
- *Graphite*, technically the highest rank, but difficult to ignite and is not so commonly used as fuel: it is mostly used in pencils and, when powdered, as a lubricant. [*2a*]

References :

1a : Mine-Engineer.Com
2a : Wikipedia