

Brief History Of Coal

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- Chemical & Geological Studies have shown that coal is formed from vegetable material like trees, plants, etc
- Fossil tree trunks or fossil roots in the coal seams prove this point
- Various ranks of coal represent different degrees in the conversion of original plant material

ORIGIN OF COAL

➤ There are 2 theories :

✓ Autochthonous (Growth in situ)

✓ Allochthonous (Drift origin)

FORMATION OF COAL

- Plant material underwent decay under moist conditions by bacterial attack
- Decay continued until absence of supply of oxygen or any other reasons which ended microbe activities
- Peat thus formed is then buried under mineral rocks & pressed into more compact materials
- Chemical reactions like dehydration, decarboxylation, dehydrogenation, etc took place where H_2O , CO_2 , CO , CH_4 & H_2S were removed & peat converted to more neutral substances - lignite
- Aging of lignite into bituminous coal & then anthracite was due to further reduction & condensation reactions

GROWTH OF COAL

- Growth in situ - Plants grew & decayed in the same area where we find coal today. Numerous fossil tree trunks or fossil roots in the coal seam are proof of this theory. Eg. Great Dismal Swamp, North Carolina, USA
- Drift Origin - Vegetable matter got carried away by water into neighbouring lagoons, lakes & estuaries. Fossil tree stems without attached roots are proof of this theory. Eg. Delta of Mississippi
- Gondwana seams in India are proof of the drift origin

TYPES OF COAL

Coal is classified into five main types, or ranks depending on the amounts and types of carbon it contains and on the amount of heat energy it can produce.

- Peat
- Lignite
- Sub-bituminous
- Bituminous
- Anthracite

TYPES OF COAL

➤ Peat

- ✓ Partly decomposed plant material accumulated in situ under temperate marshy conditions
- ✓ Not coal but first stage in the conversion of vegetable matter to coal
- ✓ Russia has 60% of world total reserves of peat
- ✓ In India it is found in the swamps of the Nilgiri Hills
- ✓ Moisture 15-25%; Ash 3-10%; VM 50-55%;
FC 25-30%

TYPES OF COAL

➤ Lignite

- ✓ Woody or fibrous brown coal
- ✓ On drying, lignite shrinks and breaks up readily. Hence difficulty in transportation
- ✓ Ignites spontaneously as it absorbs oxygen readily
- ✓ Extensive deposits in Russia & USA
- ✓ In India it is found in Neyveli in Tamil Nadu
- ✓ Moisture 10-30%; Ash 5-10%; VM 40-45%;
FC 30-35%

TYPES OF COAL

➤ Sub-bituminous

- ✓ Black in colour with dull, waxy lustre
- ✓ Denser and harder than lignite
- ✓ Appear in bands
- ✓ Found in USA, Russia, Germany, Australia
- ✓ Tertiary coals in Assam, Kashmir & Rajasthan are of this type
- ✓ Moisture 10-20%

TYPES OF COAL

➤ Bituminous

- ✓ Raw coal that we use
- ✓ It burns with a smoky yellow flame similar to that of bitumen & pitch obtained from coal tar.
- ✓ Black, usually banded. Occurs in strata called seams.
- ✓ Lustre is bright to dull
- ✓ Extensive deposits in USA, Russia, Germany, China
- ✓ 2 very big deposits in India - Ranigunge & Bokaro-Ramgarh- Karanpura coalfields. Thickest coal seam (156m) in Rajmahal, WB

TYPES OF COAL

➤ Anthracite

- ✓ Most mature & hard form of solid fossil fuel
- ✓ Sub-metallic lustre
- ✓ Found in South Wales, UK, Pennsylvania (USA)
- ✓ In India it is found in Jammu & Darjeeling
- ✓ Moisture 0.5-5%; Ash 10-35%

COAL RESERVES

