



Physical properties of Coal & Chemical Analysis of Coal

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Fuel Classification:

Type	Natural/ Primary	Secondary
Solid	Wood, Peat, Lignite, Bituminous Coal, Anthracite Coal.	Charcoal, Coke
Liquid	Petroleum	Oil, Tar Alcohols etc.
Gas	Natural Gas	Producer Gas Water Gas Blast Furnace Gas Coke Oven Gas

Physical Properties of Coal

- Physical characteristics of coal varies with variety or rank of coal
 - Low Rank: Peat & Lignite
 - High Rank: Bituminous & Anthracite
 - Colour: Yellowish Brown to Jet black
 - Lustre: Dull – Brilliant – Glossy
 - Fracture-Cleat-Cleavage
 - Hardness: 0.5 to 3
 - Specific Gravity: 0.5 to 1.35
 - Softening Property
 - Caking Property
 - Calorific Value

Analysis of Coal

➤ Proximate Analysis

➤ Moisture: 105°C - 110°C for one hour

➤ Free or Accidental Moisture

➤ Hygroscopic or Inherent Moisture

➤ Volatile: 925°C for 7 minutes

➤ Ash : Mineral Matter * 1/1.1

➤ Intrinsic

➤ Extrinsic

➤ Fixed Carbon : $100 - (\text{Moisture}\% + \text{VM}\% + \text{Ash}\%)$

➤ Calorific Value

➤ $P = 82C + aV$ (P=No of Calorie per gram, C=fixed carbon, a=constt, V=Volatile Matter)

Analysis of Coal

➤ Ultimate Analysis

➤ Carbon

➤ Hydrogen

➤ Nitrogen

➤ Sulphur

➤ Oxygen

➤ Sulphur

➤ Phosphorous

Analysis of Coal

➤ Proximate Analysis

➤ Ultimate Analysis

Emperical Formulaes

1. $GCV = \underline{85.56X [100 - \{(1.1A) + M\}] - 60M}$ K.cals/Kg

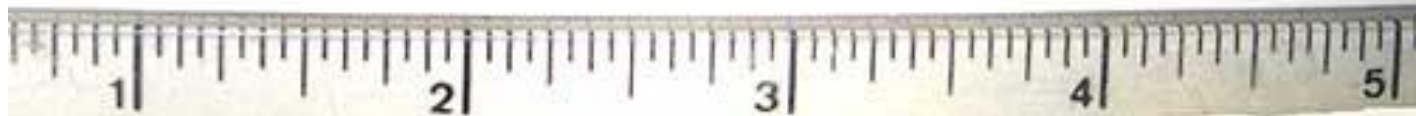
2. $UHV = 8900 - 138 X (A + M)$ K Cals/Kg

Where A= Ash% and M= moisture% dtermined at 60% RH and 40°C.

COAL RANK

- | | |
|------------------------|----------------|
| 1. ANTHRACITE | -14,000 BTU/LB |
| 2. BITUMINOUS | -12,000 BTU/LB |
| 3. SUB-BITUMINOUS | -9,000 BTU/LB |
| <hr/> | |
| 4. LIGNITE (30% WATER) | - 7,000 BTU/LB |









Any Questions??

Thank You !!!

