

## UTILIZATION OF THE GAS AND THE QUALITY REQUIRED.

It has been mentioned before that the method of gasification determines certain features of the primary gas. In order to estimate the advantages of the gasification methods, it is necessary to analyze the requirements of the gas-consuming industry.

### Heating- Public Utility Supply.

At present, this field of consumption is supplied by natural gas of 900 to 1000 B.t.u. or by carburetted water gas of 500 to 550 B.t.u./cu.ft. Supposedly this consumption is increased or has to be replaced by gas from coal. Then a gas of 500 to 800 B.t.u. is needed with 30 percent hydrocarbons and 30 to 40 percent hydrogen. Probably the gas has to be under a pressure of 10 to 20 atmospheres because carbon dioxide must be eliminated and a larger plant would be erected at the mine where production costs are lowest.

### Hydrogen Gas for the Hydrogenation and Ammonia Synthesis.

For hydrogenation, practically pure oxygen is needed. Compression of the raw gas and the elimination of carbon dioxide are unavoidable. A high hydrogen content of the primary gas is of great advantage. Hydrocarbons are a great disadvantage and should not exceed one and one-half percent. Organic sulfur is of no great importance.

For the synthesis of ammonia, a pure hydrogen can be mixed with nitrogen, or the synthesis gas can be directly produced by gasification with oxygen-enriched air or 40 to 50 percent oxygen content. Low content of methane and sulfur are essential.

#### Synthesis Gas for the Fischer-Tropsch Synthesis.

Gas of a  $\text{CO}:\text{H}_2$  ratio of 1.5:1 to 1:2 is needed. Organic sulfur and gum-forming hydrocarbons are to be reduced to a minimum as poisons for the synthesis catalyst. Compression of the gas normally is required, for the synthesis and for the elimination of carbon dioxide.

#### Gas for the Synthesis of Organic Acids.

Gas of a very high carbon monoxide content is used for the synthesis of organic acids.

#### Gas for Power Production.

Gasification of cheap fuels with air may be developed as a future method of power production in connection with a gas turbine. In this case, hot dust-free gas is needed, under pressure of 5 to 20 atmospheres.