

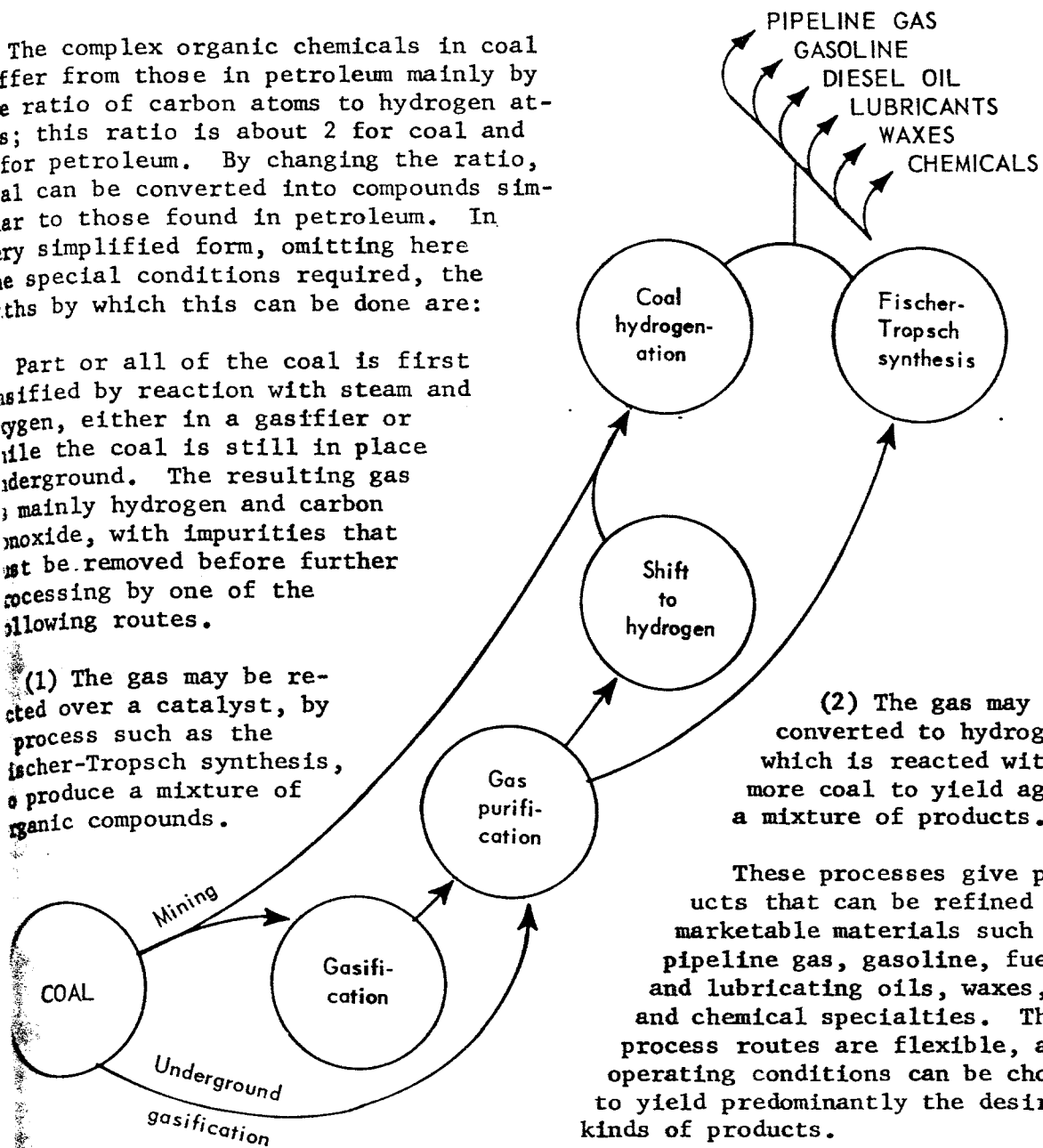
PREFACE - PATHS FROM COAL TO SYNTHETIC FUELS

The complex organic chemicals in coal differ from those in petroleum mainly by the ratio of carbon atoms to hydrogen atoms; this ratio is about 2 for coal and 1 for petroleum. By changing the ratio, coal can be converted into compounds similar to those found in petroleum. In very simplified form, omitting here the special conditions required, the paths by which this can be done are:

Part or all of the coal is first gasified by reaction with steam and oxygen, either in a gasifier or while the coal is still in place underground. The resulting gas is mainly hydrogen and carbon monoxide, with impurities that must be removed before further processing by one of the following routes.

(1) The gas may be reacted over a catalyst, by a process such as the Fischer-Tropsch synthesis, to produce a mixture of organic compounds.

(2) The gas may be converted to hydrogen, which is reacted with more coal to yield again a mixture of products.



These processes give products that can be refined to marketable materials such as pipeline gas, gasoline, fuel and lubricating oils, waxes, and chemical specialties. The process routes are flexible, and operating conditions can be chosen to yield predominantly the desired kinds of products.

Work on manuscript completed December 1958.

A corresponding summary of the research on oil from oil shale will be published later.