4－1　A COAL CONVERSION BY SUPERCRITICAL WATER

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A coal conversion process using supercritical water (SCW) was proposed and the experimental work was performed. In this process, SCW acts as not only a solvent, but also a reactant for coal pyrolysis. Significant results from the examinations indicate that the process has a potential for the utilization of coal conversion, because it appears probably more economical and environmentally acceptable than the other proposed processes. Particularly, SCW process can be applied for the conversion of low rank coals, which are almost not utilized at present due to their high concentrations of water and oxygen.

In this SCW process, phenols were found as the major components in water-soluble (WS) product. Of particular interest is that a considerable portion of expensive dihydric phenols, such as catechol, was detected in the WS product. Moreover the residue and water-insoluble (WI) product by this process can be used as the qualified fuel because it has low ash content, high calorific value and rapid combustion rate.

In this paper, an industrial flow of this process is suggested. On the basis of this flow, the feasibility study of this SCW process is performed. The study indicates that the qualified fuel with valuable by-products, such as dihydric phenols can be produced by SCW coal conversion process with low cost.

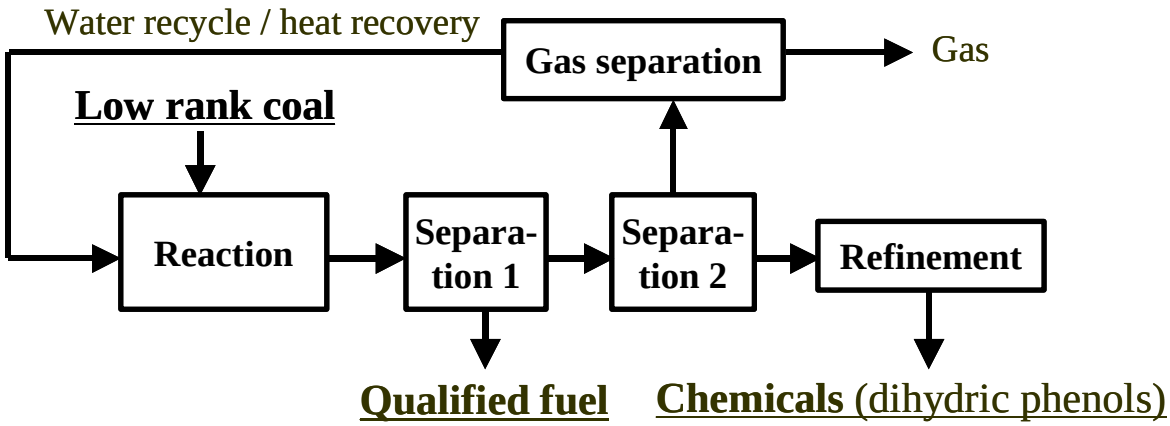

Fig.　A main flow of coal conversion system by SCW