

PROCEEDINGS, INDONESIAN PETROLEUM ASSOCIATION
Twenty-Fifth Silver Anniversary Convention, October 1996

**DEVELOPMENT OF CHEMICALS FROM INDUSTRIAL WASTES
FOR IMPROVING OIL RECOVERY**

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ABSTRACT

Several methods of enhanced oil recovery are encouraging in Indonesia as well as in the world today. In compliance with this, research in the area of enhanced oil recovery (EOR) is still carried out by many examiners. In fact, experiments are becoming more and more well developed. One of these research areas is in the exploitation of chemicals for seeking the enhancement of oil recovery. Even though several experiments have been done in this area, the application in the field often fails. This not only is caused by expensive cost of chemicals, but also because the process as it is applied in the field is not compatible with the process in the laboratory. There are still many problems that need to be solved in the area of EOR basic research to allow that research to be applied in the field for improving oil recovery.

The goal of this research is to develop chemical formulas produced from local material and physical or chemical processes which can be used to optimize recovery and hence minimize residual oil in the simulated reservoir. In order to determine the chemicals used in this experiment, some requirement

had to be met by each chemical as follows : 1) it must be easily found in Indonesia; 2) it must be produced cheaply; 3) it should be industrial waste which can be used as EOR chemical; 4) it must have high recoverability; and 5) it must not be a petroleum derivative.

The whole research can be divided into three categories : development of chemicals from industrial waste, oil displacement process and simulation. Effort to develop chemicals for EOR which are applicable in Indonesian reservoirs have been completed. Several processes have been developed to produce EOR chemicals such as isolation of lignin from black liquor from Indonesian pulp industries, pyrolysis and hydrolysis of palm oil fruit fibers and stems.

Research on lignin isolation from black liquor (a waste product of the pulp industries) has been done using black liquor from several Indonesian pulp plants. The lignin formed from the isolation process was processed further to become sodium ligno sulphonate (SLS).

The goal of the pyrolysis and hydrolysis experiment of palm oil fruit fibers and stems was to get components which can be used as surfactant or co-surfactant for EOR processes.

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