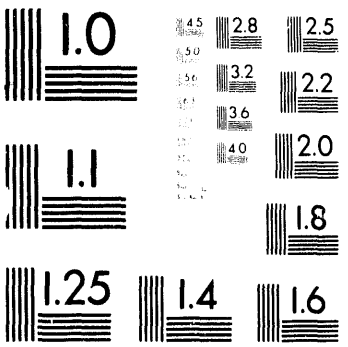
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STATUS REPORT

LITERATURE SURVEY AND DOCUMENTATION ON ORGANIC SOLID DEPOSITION PROBLEM

By Ting-Horng Chung

Work Performed for
U. S. Department of Energy
Under Cooperative Agreement DE-FC22-83FE60149

National Institute for Petroleum and Energy Research
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Task 1 - State-of-the-Art Report, BE5A Project

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Jerry F. Casteel, Program Manager
U.S. Department of Energy
Bartlesville Project Office

DISCLAIMER

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LITERATURE SURVEY AND DOCUMENTATION CONCERNING ORGANIC SOLID DEPOSITION

By Ting-Horng Chung

SUMMARY

Organic solid deposition is often a major problem in petroleum production and processing. Recently, this problem has attracted more attention because operating costs have become more critical to the profit of oil production. Also, in miscible gas flooding, asphaltene deposition often occurs in the wellbore region after gas breakthrough and causes plugging. The organic deposition problem is particularly serious in offshore oil production. Cooling of crude oil when it flows through long-distance pipelines under sea water may cause organic deposition in the pipeline and result in plugging. Oil companies must be assured that organic deposition will not cause serious production problems before they invest a huge amount of money in exploration and development in deep-water oil fields. Oil companies are now focusing on the development of deep water oil recovery in the Gulf of Mexico. This area represents one of the best remaining U.S. opportunities accessible to the oil industry, and finding reserves has been good (discoveries announced in 1991 totaled more than 1 billion barrels oil). At least 12 oil and gas companies are considering a common development strategy to exploit reservoirs economically in 2,000 to 6,000 ft of water.

NIPER's Gas EOR Research Project has been devoted to the study of the organic solid deposition problem for three years. We have developed a model to predict wax and asphaltene precipitation at equilibrium condition. A paper on this subject was presented at the SPE 1992 Annual Technical Conference in Washington, D.C. In addition, three topical reports have been published by DOE. NIPER's research effort has attracted industry's attention. We have received many requests for technical support. Recently, the DeepStar project committee on thermo-technology development and standardization has asked us to provide them with NIPER's expertise and experience. It is a good opportunity for NIPER to contribute its technology to help the oil industry to solve their problem and to boost domestic oil production. To assist the oil industry, we are preparing a state-of-the-art review on the technical development for the organic deposition problem. In the first quarter, this project has completed a literature survey and documentation. Total of 258 publications (114 for wax, 124 for asphaltene, and 20 for related subjects) were collected and categorized. This literature survey was focused on the two subjects: wax and asphaltene. The subjects of bitumen, asphalt, and heavy oil are not included. Also, the collected publications are mostly related to production problems; the subjects on refinery processes are not of interest. A thorough review of the collected publications is ongoing, and a topical report will be delivered in FY94.

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III. Field Problems and Solution Methods

1. Field problems and experience: 3, 25, 58, 63, 65, 75, 105, 108, 110, 111

2. Solution methods for asphaltic deposition: 2, 42, 60, 66, 105, 109, 114

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