Quarterly Report: May 1 - July 31, 1991

DE92 000334

"Catalysis and Co-Catalysis of Bond Cleavages in Coal and Coal Analogs"

DOE Grant #90PC90298

Principal Investigator:

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Personnel:

Dr. Xiaolian Shi began work in this program as a research associate on June 30, 1991.

Research Progress:

Studies have been initiated on the effects of catalytic agents on hydrogen transfer thermolyses of carbon-carbon bonds. However, initial runs employing 1-benzyl-naphthalene as the substrate encountered problems due to leaks in the high pressure reaction vessels. New equipment is on order.

In order to study the mechanisms of carbon-carbon bond cleavages, 1-benzyl-naphthalene-4-d has been synthesized by the route shown below:

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In order to test the hypothesis that 1,2-dihydroaromatic compounds are intermediates in reductive cleavages of carbon-carbon bonds, we have initiated studies aimed at converting 1-tetralone-4-d₂ (A) into 1,1-dibenzyl-1,4-dihydronaphthalene-4-d₂ (B).

Evidence presented in previous reports that thermolysis of sulfur-carbon and chlorine-carbon bonds in 9-substituted anthracenes results largely in formation of addition products rather than hydrogenolysis raised the possibility that similar processes may be occurring in thermolysis of naphthalene derivatives in tetralin solutions. Since formation of naphthalene cannot be confirmed in reactions carried out in tetralin, 1,2,3,4,5,6,7,8-octahydroanthracene was prepared as an alternative solvent. The procedure shown below was a variant on literature procedures for the synthesis.

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