

CATALYTIC DEHYDROGENATION OF LOW-TEMPERATURE LIGNITE PITCH

Richard L. Rice and John S. Berber

U.S. Bureau of Mines
Morgantown, West Virginia

ABSTRACT

Pitch obtained from the vacuum distillation of low-temperature lignite tar is not suitable for present commercial applications. To meet specifications for existing markets, the characteristics of the pitch must be changed. One method for modifying pitch is catalytic dehydrogenation. Palladium (30%) on CaCO_3 was chosen as the reference catalyst because it has given good results in other work. Various metal oxide catalysts were tested; nickel oxide gave the highest equivalent hydrogen removed, 14.8%. As a hydrogen-rich gas producer, nickel catalyst gave the highest yield with an off-gas containing 4.22 millimols of hydrogen per gram of pitch while palladium catalyst off-gas contained 1.22 millimols of hydrogen per gram of pitch. The best methane producing catalyst was palladium oxide with an off-gas containing 3.07 millimols of methane per gram of pitch. Aluminum was next with an off-gas containing 2.62 millimols of methane per gram of pitch.