FUEL NITROGEN EVOLUTION: COUPLING BETWEEN RANK AND HEATING CONDITIONS. J.F.Freihaut, United Technologies Research Center, East Hartford, CT 06108.

A range of coals from a variety of geologic provinces have been devolatilized using both heated grid and flash lamp apparati. Lignite, sub-bituminous, high, medium and low volatile bituminous and anthracite samples have been investigated. Final particle temperatures of 400 to 1500 C were obtained with the heated grid and heating rates approaching 10^6 C/sec in the flash lamp apparatus. In inert conditions and moderate heating rates (10^3 ^oC/sec or less) the evolution of fuel nitrogen mirrors, on a mass fraction basis, the evolution of parent coal as char, tar or light gas. The evolution of fuel nitrogen as a light gas is observed to be coupled to the fate of primary tars as they evolve. Thus the evolution of fuel nitrogen as a light gas during pyrolysis is observed to be rank dependent via the thermal stability characteristics of the parimary tars.