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NO_x Formation and Control: On Thermochemistry of NNH

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Abstract:The NNH species mechanism pathway is an important consideration in current NO_x combustion pollutants formation at high temperatures, and low residence time control modelling. However, no detailed Table of NNH thermochemical properties exists in the open chemicals databases. Attempt is made in this paper at developing a detailed NNH thermochemical data Table. The 7-term NASA polynomial coefficients for NNH are applied. No 9-term coefficients yet cited. The thermochemical quantities tabulations follow the format of Barin as reported in the survey by Jacobson of available source compendia of thermochemical data. Two Methods of solutions by additivity for the energies of formations, by linking dynamically, related and consistent listings in terms of the choice of stable molecule reference elements, lead to similar results. NASA coefficients were used to precision, but round-off of final listed results is to 3-decimals. Curve-fitted equations of equilibrium constant for the two methods, with predictions accurate to within maximum deviations of ± 0.50 -percent, and ± 0.02 -percent from tabulated data, and averaged absolute uncertainties of 0.08-percent, and 0.01-percent in the 1000 -to-6000 K temperature range, respectively are presented.

Keywords: Thermochemistry; NNH; Pollutant Formation; NO_x Chemistry; Combustion Reactions.

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