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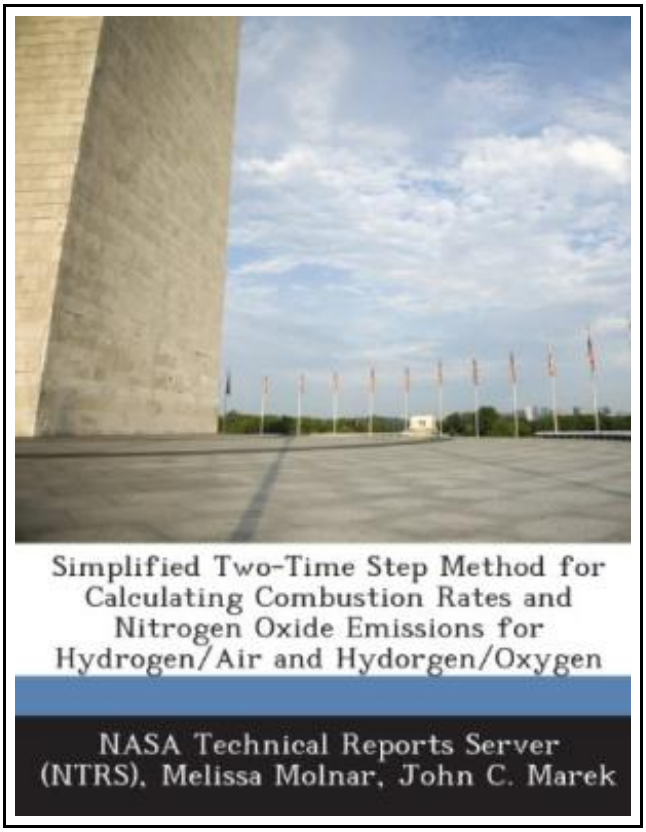

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SIMPLIFIED TWO-TIME STEP METHOD FOR CALCULATING COMBUSTION RATES AND NITROGEN OXIDE EMISSIONS FOR HYDROGENAIR AND HYDORGENOXYGEN

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Bibliogov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 44 pages. Dimensions: 9.7in. x 7.4in. x 0.1in.A simplified single rate expression for hydrogen combustion and nitrogen oxide production was developed. Detailed kinetics are predicted for the chemical kinetic times using the complete chemical mechanism over the entire operating space. These times are then correlated to the reactor conditions using an exponential fit. Simple first order reaction expressions are then used to find the conversion in the reactor. The method uses a two-time step kinetic scheme. The first time averaged step is used at the initial times with smaller water concentrations. This gives the average chemical kinetic time as a function of initial overall fuel air ratio, temperature, and pressure. The second instantaneous step is used at higher water concentrations (1 x 10(exp -20) molescc) in the mixture which gives the chemical kinetic time as a function of the instantaneous fuel and water mole concentrations, pressure and temperature (T4). The simple correlations are then compared to the turbulent mixing times to determine the limiting properties of the reaction. The NASA Glenn GLSENS kinetics code calculates the reaction rates and rate constants for each species in a kinetic scheme for finite kinetic rates. These reaction rates are used to calculate the necessary chemical kinetic times. This time is regressed over the complete initial conditions using the Excel regression routine. Chemical kinetic time equations for H2 and NOx are obtained for H2air fuel and for the H2O2. A similar correlation is also developed using data from NASA s Chemical Equilibrium Applications (CEA) code to determine the equilibrium temperature (T4) as a function of overall fuelair ratio, pressure and initial temperature (T3). High values of the regression coefficient R2 are obtained. This item ships from La Vergne,TN. Paperback.

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