Numerical Study for Optimal SNCR Process

Chen, Luke; Lee, Wen-Nan

The challenge of a SNCR De-NOx process is originated from the difficulty in controlling the NOx reacts with NH/sub 3/ within a narrow temperature window. The on-site SNCR operation can hardly control NH/sub 3/ reacts with NOx completely. Therefore less NOx reduction and NH/sub 3/ slip becomes a problem in operating a SNCR process. In this study we try to optimize operation parameters such as reaction temperature, NOx/NH/sub 3/ ratio, additive ratios such as CH/sub 4//NH/sub 3/ and H/sub 2//NH/sub 3/ ratio, and residence time. When a SNCR process operates within the optimized parameters it then result in high NOx reduction and less ammonia slip. A numerical technique is used to simulate the SNCR kinetics under various combinations of the corresponding operation parameters. The numerical results are verified by some experimental data. The verified numerical technique then was used for simulating the SNCR kinetics and for searching the optimal SNCR operation parameters.