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Luan T. Hoang, Box 41042, Lubbock, TX 79409, **Truyen V. Nguyen**, 302 Buchtel Common, Akron, OH 44325, and **Tuoc V. Phan*** (phan@math.utk.edu), 227 Ayress Hall, 1403 Circle Drive, Knoxville, TN 37996. *Self-Diffusion and Cross-Diffusion Equations: $W^{1,p}$ -Estimates and Global Existence of Smooth Solutions.*

We investigate the global time existence of smooth solutions for the Shigesada-Kawasaki-Teramoto system of cross-diffusion equations of two competing species in population dynamics. If there are self-diffusion in one species and no cross-diffusion in the other, we show that the system has a unique smooth solution for all time in bounded domains of any dimension. We obtain this result by deriving global $W^{1,p}$ -estimates of Calderón-Zygmund type for a class of nonlinear reaction-diffusion equations with self-diffusion. These estimates are achieved by employing Caffarelli-Peral perturbation technique together with a new two-parameter scaling argument. (Received January 22, 2014)