

## Supporting Information

### Calculations of Propagation of Error

95% confidence intervals for the rate constants were determined from their standard error, obtained from the nonlinear regression output, and t-values read from a student t distribution table:

$$k_i = k_i \pm \text{SE}(k_i) * t_{(\alpha/2)} (n - 2)$$

where  $k_i$  correspond to either  $k_{\text{obs}}$ ,  $k_1$ , or  $k_2$ , SE is the standard error,  $\alpha = 0.05$  (95% confidence interval),  $n$  is the number of experimental data used in the regression, and  $(n - 2)$  is the number of degrees of freedom. Error propagation calculations were done to estimate the 95% confidence intervals for the yields of products. For example, for the CF yield (CF yield =  $k_1/k_{\text{obs}}$ ), the standard error of the CF yield,  $\text{SE}(\text{CF yield})$ , due to the standard errors of  $k_1$  and  $k_{\text{obs}}$ ,  $\text{SE}(k_1)$  and  $\text{SE}(k_{\text{obs}})$ , can be expressed as<sup>1</sup>:

$$\text{SE}(\text{CF yield}) = \sqrt{\left(\frac{\partial \text{CF yield}}{\partial k_1}\right)^2 \text{SE}^2(k_1) + \left(\frac{\partial \text{CF yield}}{\partial k_{\text{obs}}}\right)^2 \text{SE}^2(k_{\text{obs}})}$$

with

$$\left(\frac{\partial \text{CF yield}}{\partial k_1}\right) = \left(\frac{1}{k_{\text{obs}}}\right)$$

$$\left(\frac{\partial \text{CF yield}}{\partial k_{\text{obs}}}\right) = \left(-\frac{k_1}{k_{\text{obs}}^2}\right)$$

so that

$$\text{CF yield} = \text{CF yield} \pm \text{SE}(\text{CF yield}) * t_{(\alpha/2)} (n - 2)$$

<sup>1</sup>Skoog, D.A.; West, D.M.; Holler, F.J. *Fundamentals of Analytical Chemistry*; Thomson Learning, Inc., 1996. pp. 33-39.