

## Supporting Information

### **Efficient aerobic oxidation of alcohols catalyzed by NiGa hydrotalcites in the absence of any additives**

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## Calculation of Weisz-Prater Criterion [1]

$$\phi_{\text{WP|A}} = \frac{r_a R_p^2}{C_{s,A} D_{\text{eff},A}}$$

$r_a$  = observed reaction rate, mol/cm<sup>3</sup> · s

$R_p$  = catalyst particle radius, cm

$C_{s,A}$  = the concentration of a reactant “A” at the catalyst surface, mol/cm<sup>3</sup>

$D_{\text{eff}|A}$  = effective diffusivity of a reactant “A”, cm<sup>2</sup>/s

$$= D_{b,A} \frac{(1-\lambda)^2}{1+P\lambda} \quad \text{where}$$

$D_{b,A}$  = the diffusivity of a reactant “A” in the bulk phase, cm<sup>2</sup>/s; calculated by Wilke-Chang method [2].

$\lambda$  = the ratio of the radius of the diffusing molecule to the pore radius

$P$  = a fitting parameter, estimated according to ref. [3].

$$\phi_{\text{WP|O}_2} = \frac{\left( 0.273 \times 10^{-6} \frac{\text{mol}}{\text{cm}^3 \cdot \text{s}} \right) (1.8 \times 10^{-3} \text{cm})^2}{\left( 7.9 \times 10^{-6} \frac{\text{mol}}{\text{cm}^3} \right) \left( 1.11 \times 10^{-4} \frac{\text{cm}^2}{\text{s}} \right)} = 1 \times 10^{-3}$$

$$\phi_{\text{WP|benzyl alcohol}} = \frac{\left( 0.273 \times 10^{-6} \frac{\text{mol}}{\text{cm}^3 \cdot \text{s}} \right) (1.8 \times 10^{-3} \text{cm})^2}{\left( 1.25 \times 10^{-4} \frac{\text{mol}}{\text{cm}^3} \right) \left( 2.77 \times 10^{-5} \frac{\text{cm}^2}{\text{s}} \right)} = 2.6 \times 10^{-4}$$

## Reference

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3. M. Ternan, The diffusion of liquids in pores, *Can. J. Chem. Eng.* 65 (1987) 244–249.