

Supporting Information

Legend to the deposited figures

Figure S1. Spectrophotometric titration of the formed $\text{La}(\text{NMHA})^{2+}$, $I = 2 \text{ M}$ (NaClO_4) at 25°C , $\text{pH} = 6.52$ (top) - 3.75 (bottom), $[\text{La}(\text{III})] = 0.004 \text{ M}$, $[\text{NMHA}] = 0.00024 \text{ M}$.

Figure S2. Spectrophotometric titration of the formed $\text{Cu}(\text{NMHA})^+$, $I = 2 \text{ M}$ (NaClO_4) at 25°C , $\text{pH} = 3.64$ (top) - 0.85 (bottom), $[\text{Cu}(\text{II})] = 0.04 \text{ M}$, $[\text{NMHA}] = 0.004 \text{ M}$.

Figure S3. Plot of k_{obs} vs. $[\text{HAc}]$ for complexation of $\text{Cu}(\text{II})$ with NMHA at 25°C , $[\text{Cu}(\text{II})] = 0.04 \text{ M}$, $[\text{NMHA}] = 0.004 \text{ M}$, $I = 2 \text{ M}$, (NaClO_4), $\text{pH} = 4.55$ in all cases.

Figure S4. Plot of k_{obs} vs. $[\text{Cu}(\text{II})]$ for complexation of $\text{Cu}(\text{II})$ with NMHA at 25°C , $[\text{NMHA}] = 0.004 \text{ M}$, $\text{pH} = 4.35$ (acetate buffer), $I = 2 \text{ M}$, (NaClO_4).

Figure S5. Plot of k_{obs} vs. $[\text{La}(\text{III})]$ for complexation of $\text{La}(\text{III})$ with NMHA at 25°C , $[\text{NMHA}] = 0.002 \text{ M}$, $\text{pH} = 7.55$ (HEPES buffer), $I = 2 \text{ M}$, (NaClO_4).

Figure S6. Plot of k_{obs} vs. pH for complexation of $\text{Cu}(\text{II})$ with NMHA at 25°C , $[\text{Cu}(\text{II})] = 0.04 \text{ M}$, $[\text{NMHA}] = 0.004 \text{ M}$, $[\text{HAc}] = 0.4 \text{ M}$, $I = 2 \text{ M}$, (NaClO_4) (full circles), and k_{obs} vs.

pH, at 25 °C, [Cu(II)] = 0.05 M, [H₄dfb⁺] = 0.005 M, [HAc]=0.4 M, *I* = 2 M, (NaClO₄) (empty circles).

Figure S7. Plot of k_{obs} vs. pH for complexation of La(III) with NMHA at 25 °C, [La(III)] = 0.01 M, [NMHA] = 0.001 M, [HEPES]= 0.01 M, *I* = 2 M, (NaClO₄) (full circles), and k_{obs} vs. pH at 25 °C, [La(III)] = 0.001 M, [H₄dfb⁺] = 0.0001 M, [HEPES]= 0.01 M, *I* = 2 M, (NaClO₄) (empty circles).

Figure S8. Eyring plots for complexation of La(III) (full circles) and Cu(II) (open circles) with NMHA. Conditions are: [La(III)] = 0.01 M, [NMHA] = 0.001 M, pH = 7.55 (HEPES buffer), *I* = 2 M, (NaClO₄) and [Cu(II)] = 0.04 M, [NMHA] = 0.004 M, pH = 4.35 (acetate buffer), *I* = 2 M, (NaClO₄).

Figure S9. Eyring plots for complexation of La(III) (full circles) and Cu(II) (open circles) with H₄dfb⁺. Conditions are: [La(III)] = 0.01 M, [H₄dfb⁺] = 0.0005 M, pH = 7.55 (HEPES buffer), *I* = 2 M, (NaClO₄) and [Cu(II)] = 0.1 M, [H₄dfb⁺] = 0.005 M, pH = 4.35 (acetate buffer), *I* = 2 M, (NaClO₄).

Figure S10. Eyring plots for the rotation about the hydroxamate C-N bond in NMHA (open circles) and H₄dfb⁺ (C-terminal, full circles).

Fig. S1

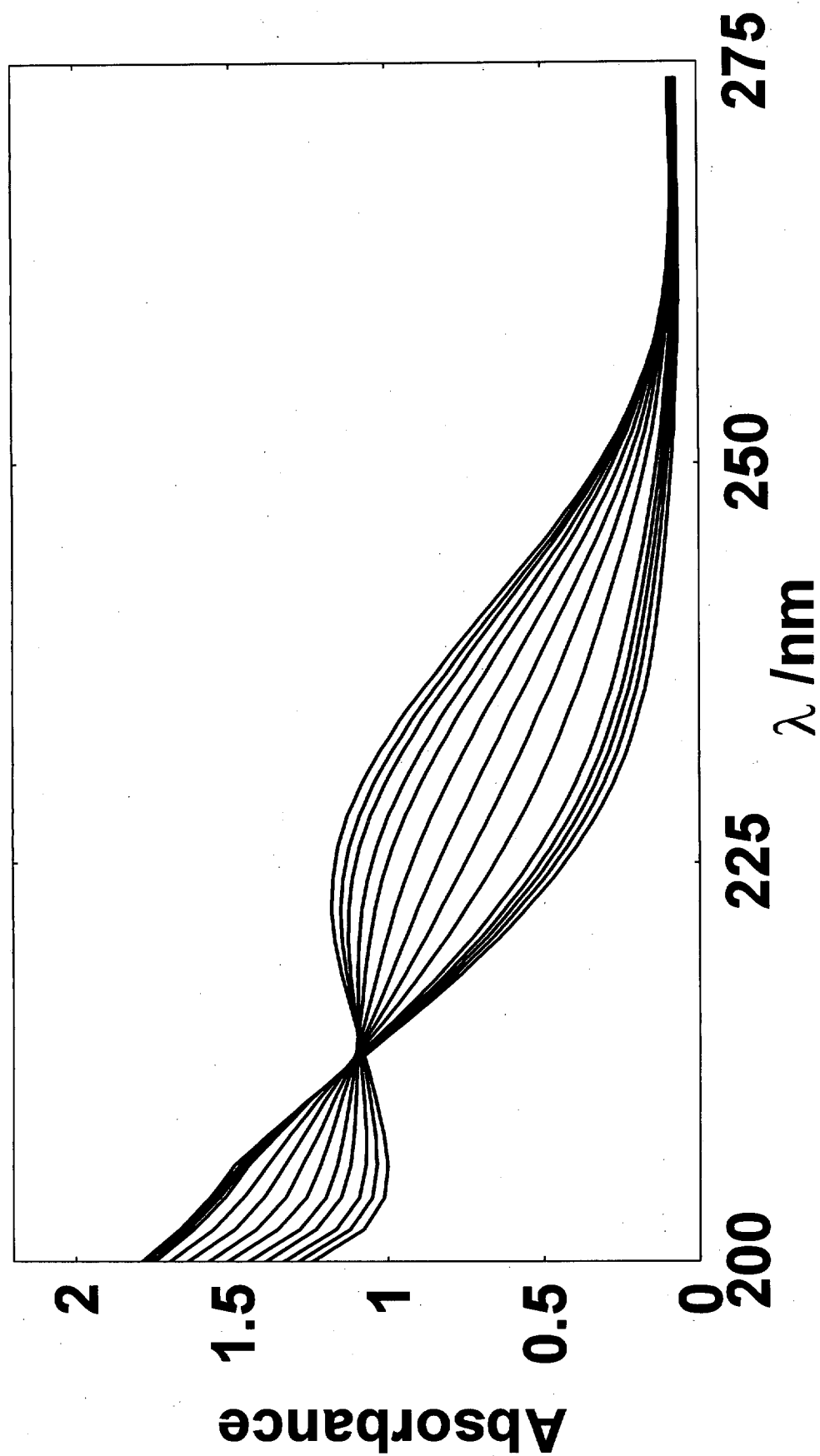
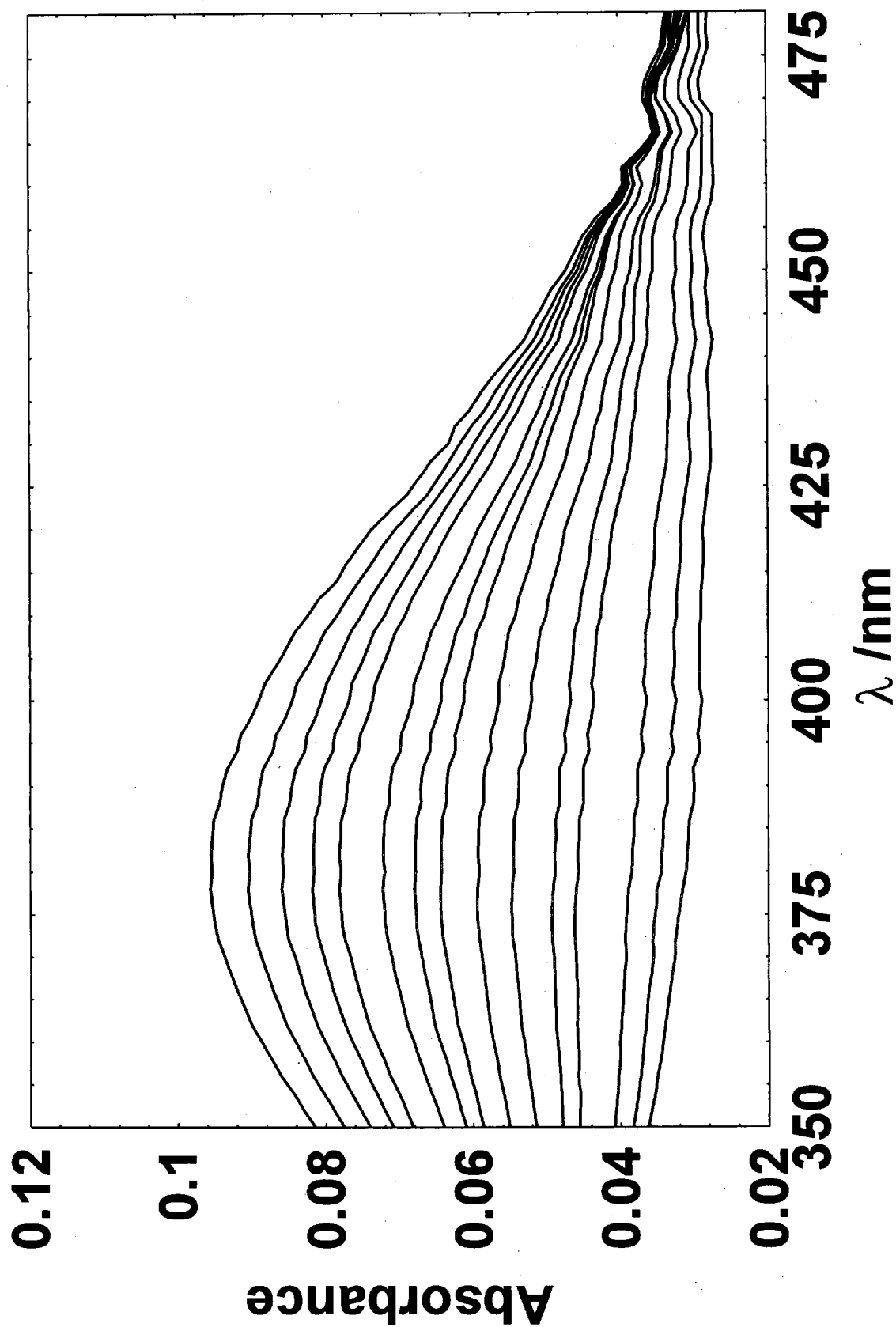


Fig. S2



S5

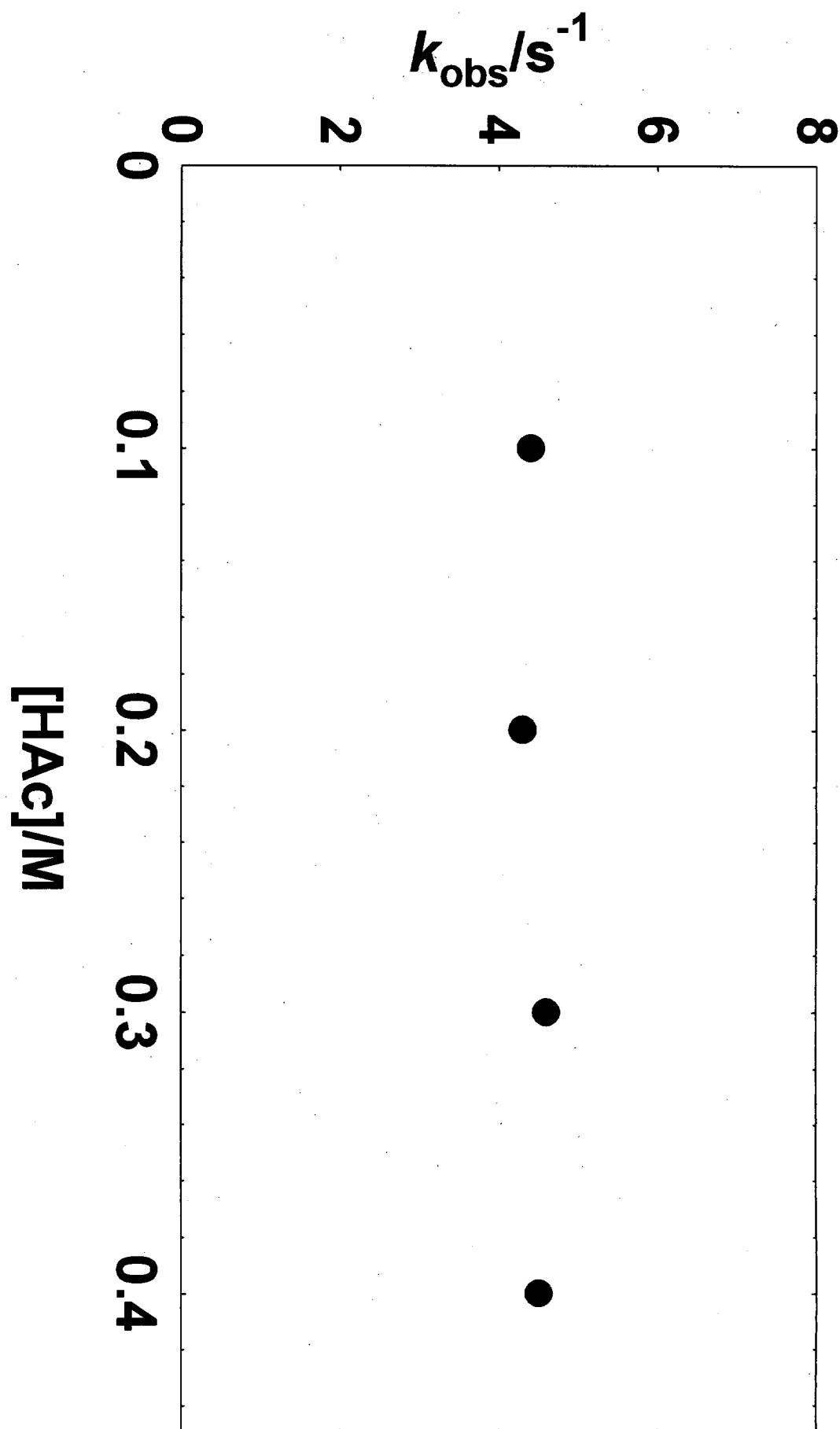


Fig. S3

S6

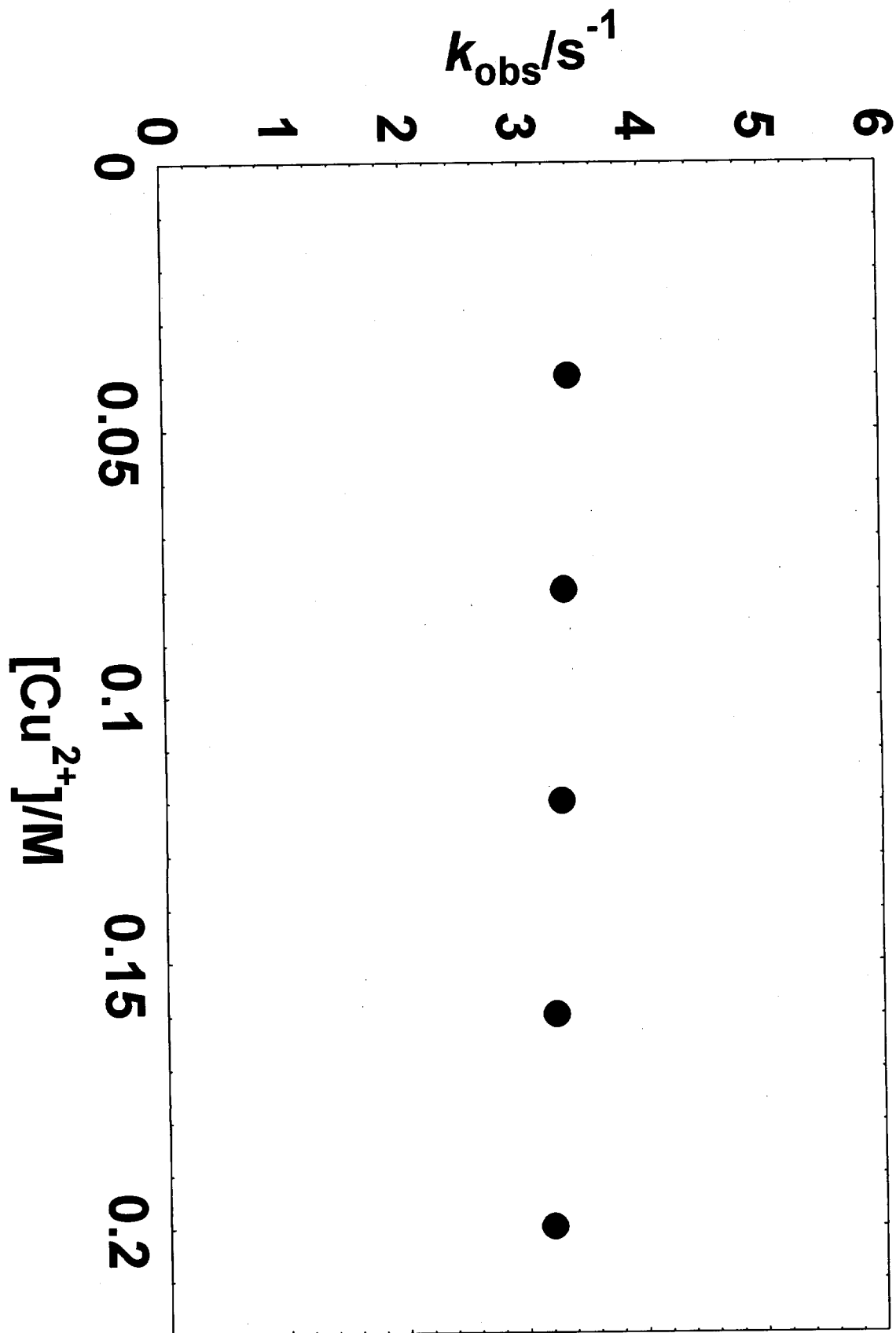
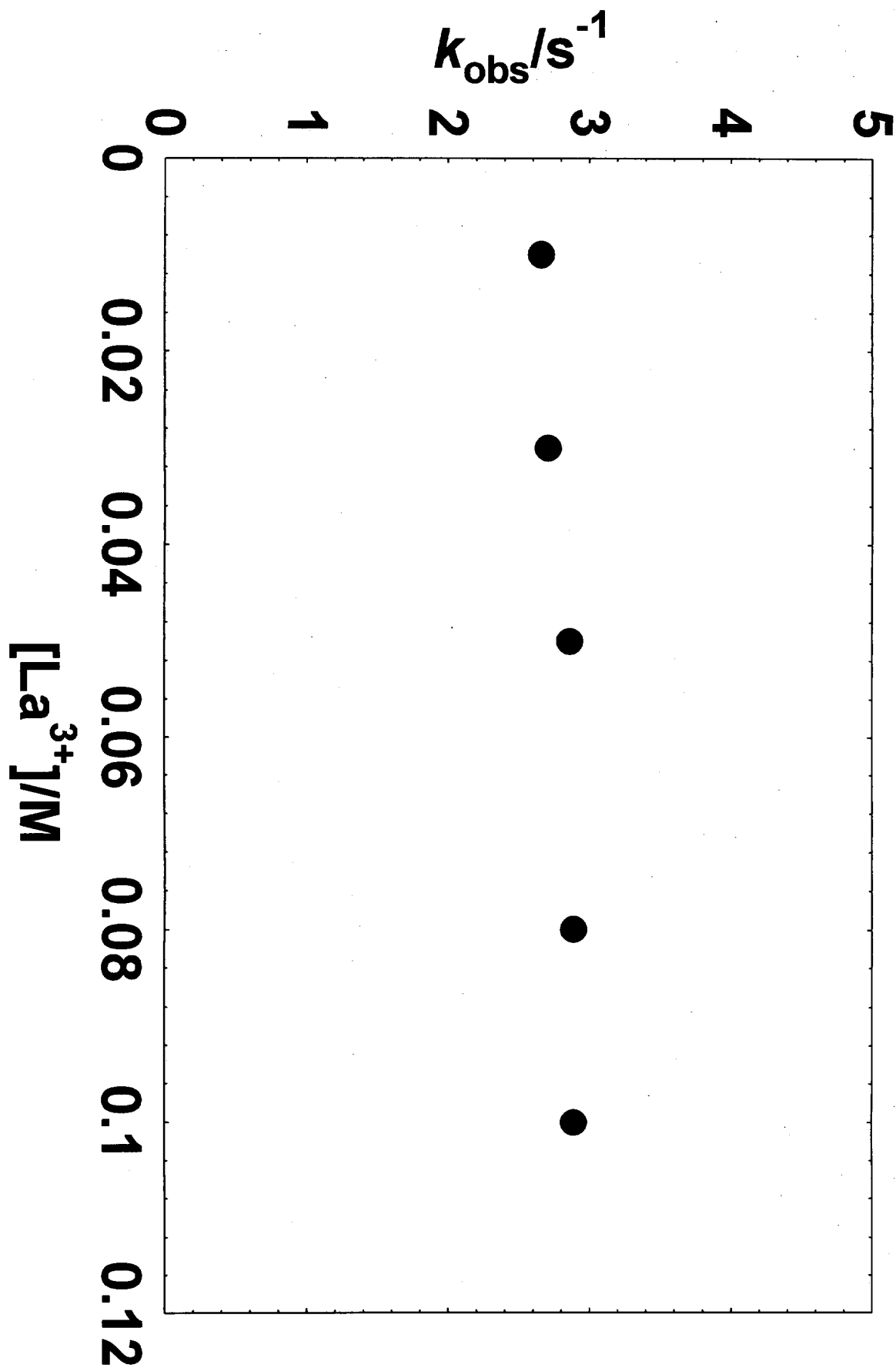


Fig. S4



S8

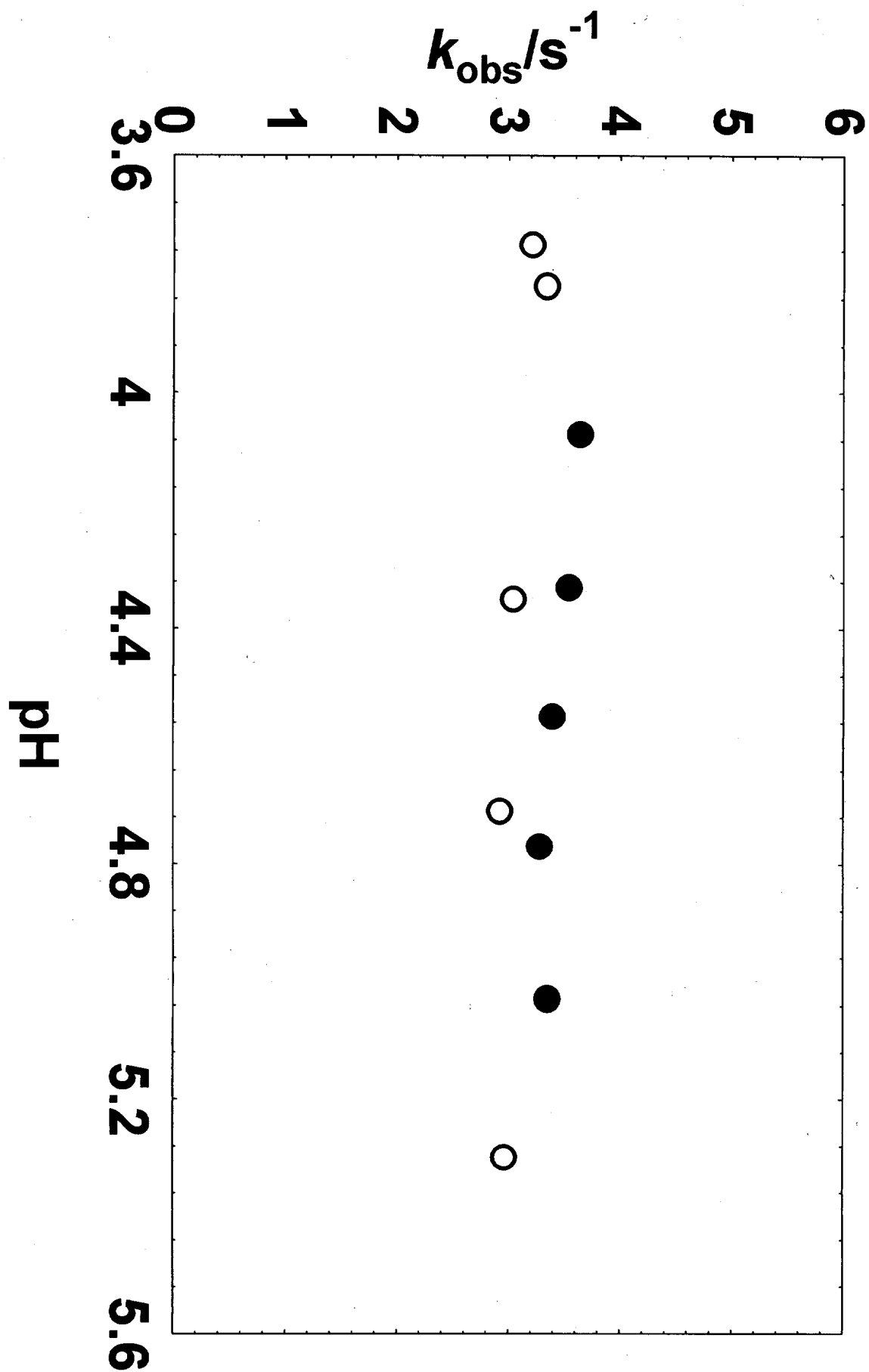
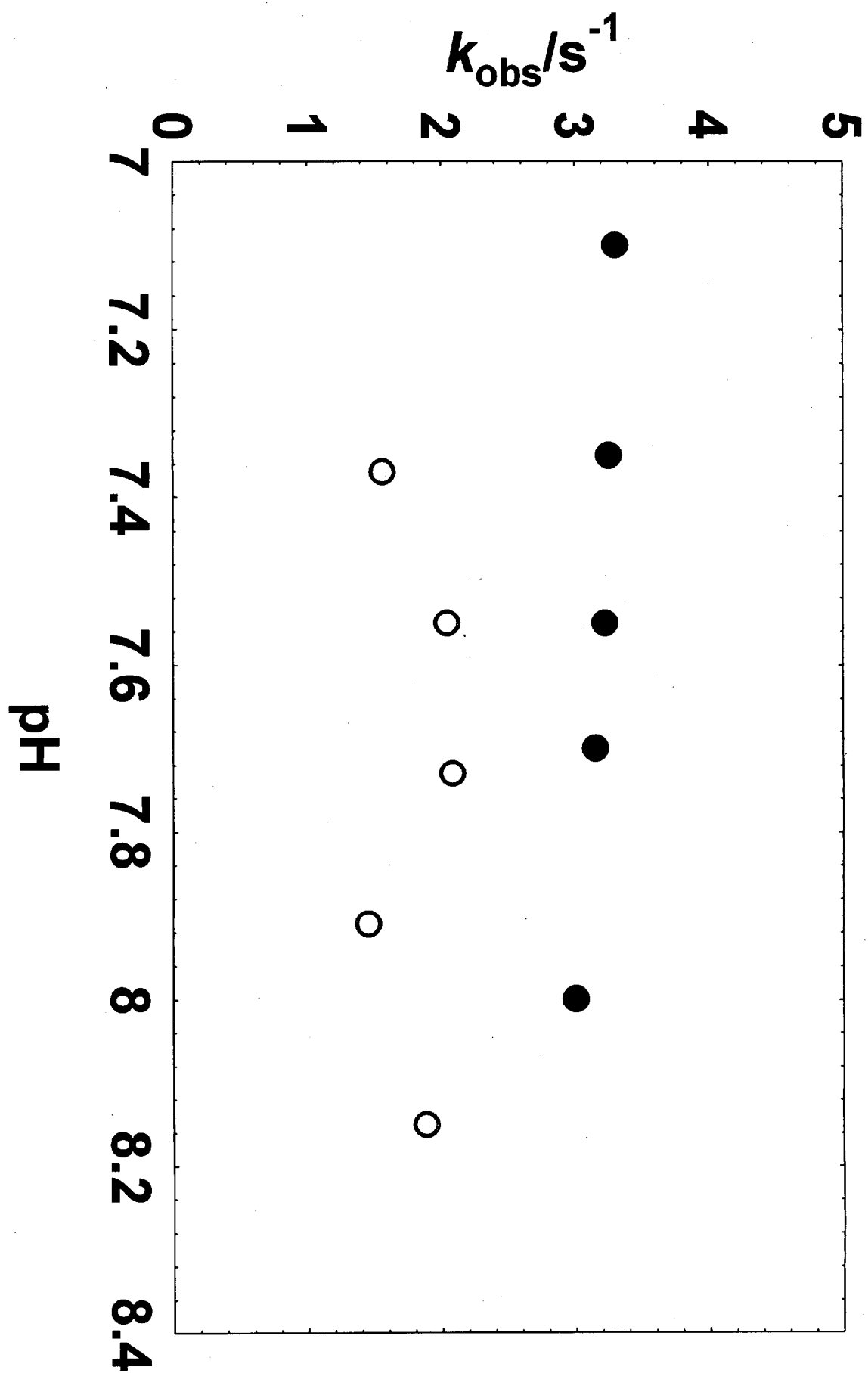


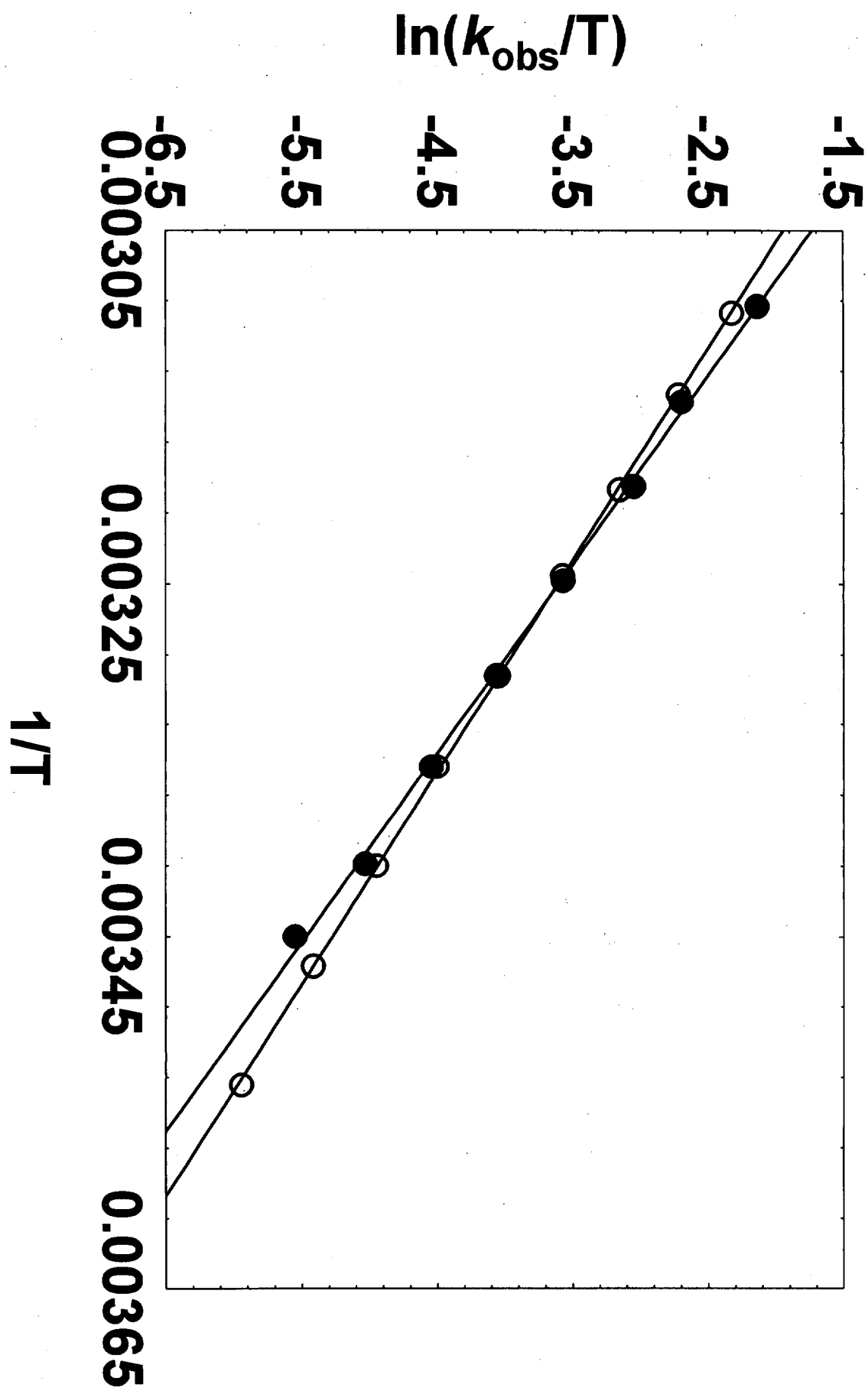
Fig. S6

S9

Fig. S7



S10



S11

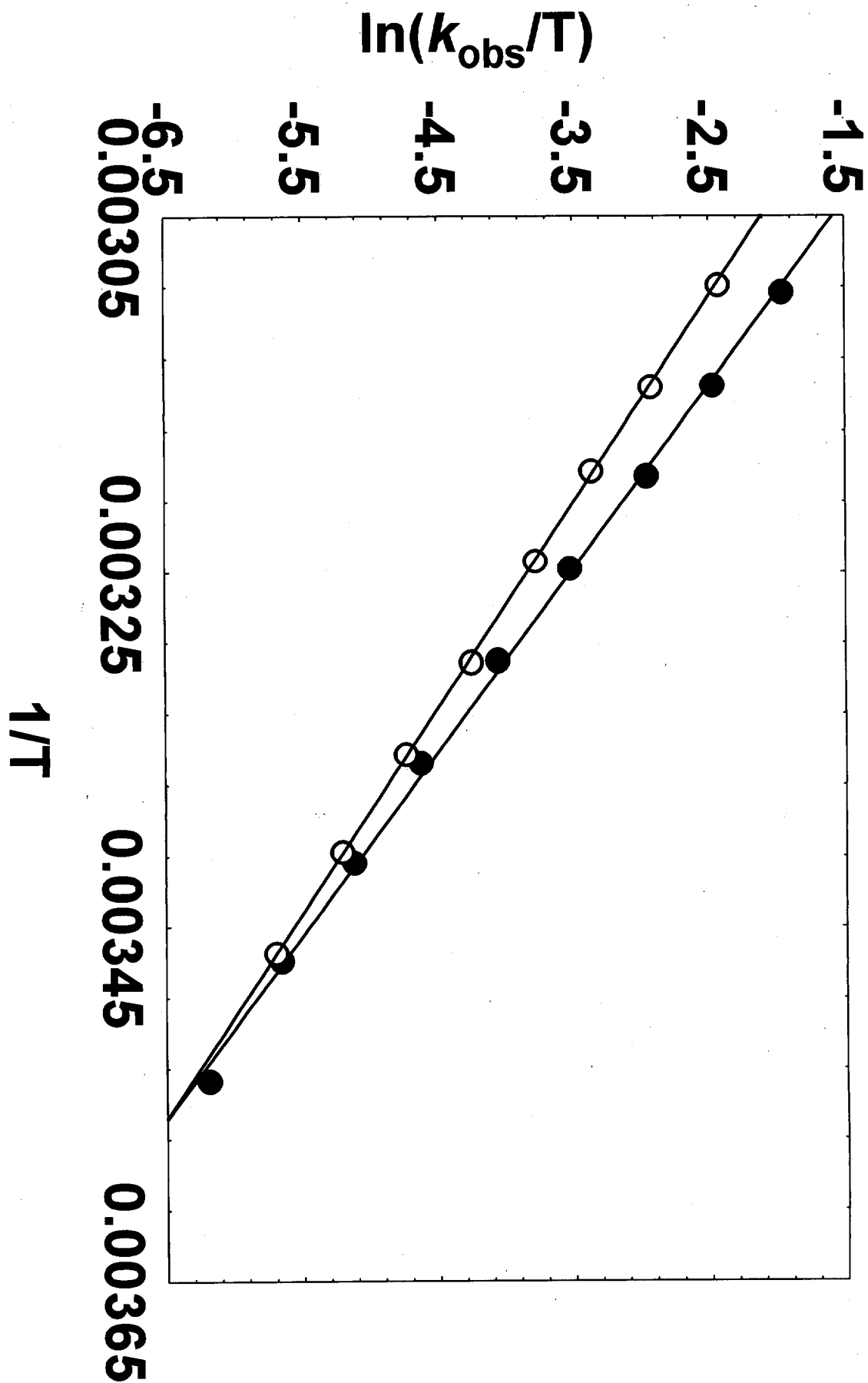


Fig. S9

S12

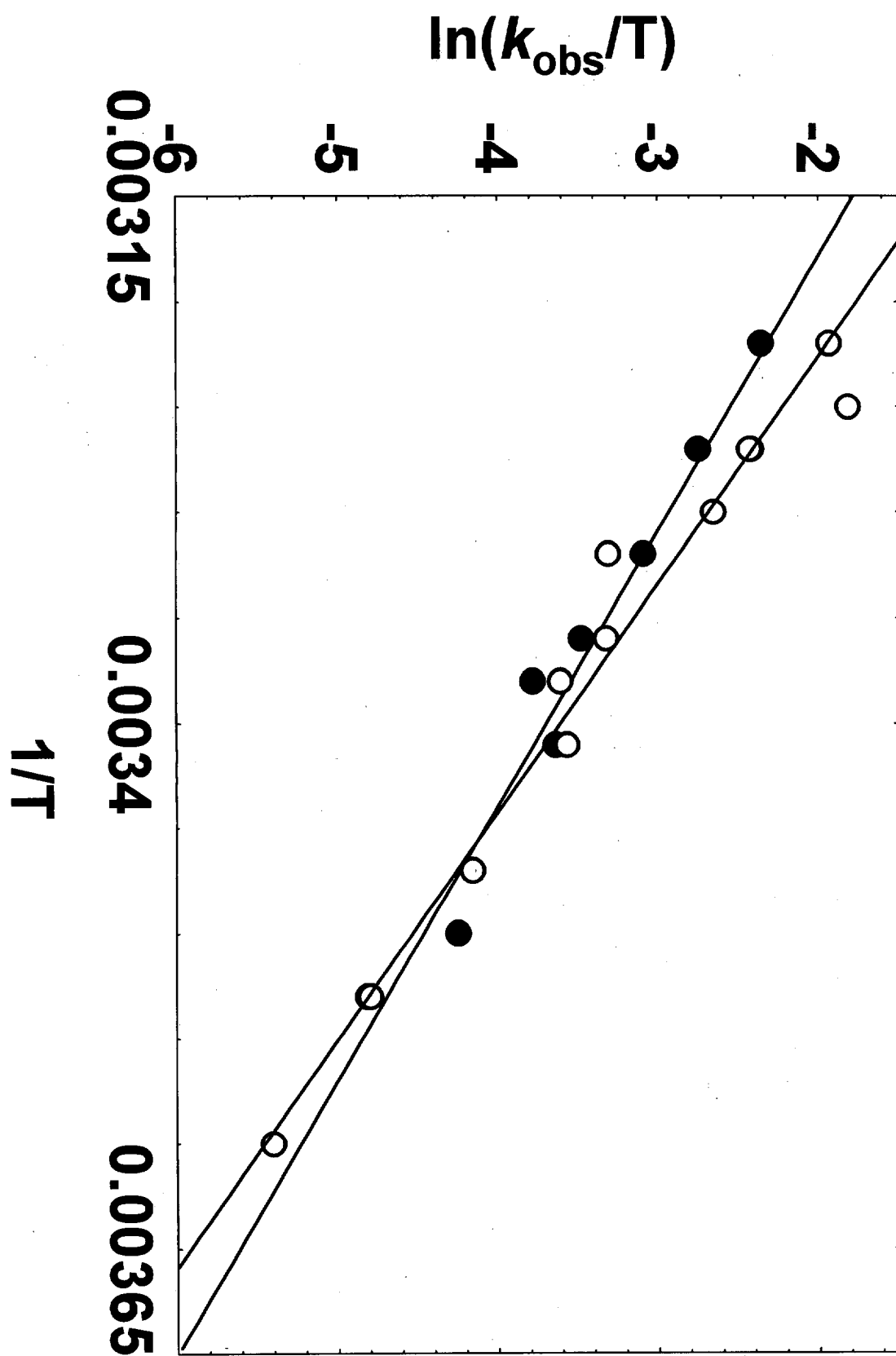


Fig. S10