Hydroxo complexes

- $10^{-4}$M $\text{Cd}_T$
- Figure 8.2, pg.369 in Benjamin
Chloride Complexes

- $10^{-4}$M Cd\(_\text{T}\)
- Low pH (no OH complexes)
  - Figure 8.5, pg.376 in Benjamin

Mixed OH, Cl complexes

- $10^{-4}$M Cd\(_\text{T}\); [Cl\(-\)] = 0.5M
  - Figure 8.6, pg.379 in Benjamin
3D Surface: Cl, OH complexes

- Fig 8.7 in Benjamin

Slice shown in Fig. 8.6

Cd(OH)$_2$ Precipitate

- no [Cl$^-$]

- Figure 8.12, pg. 401 in Benjamin
Cd(OH)$_2$ (s) with Cl$^-$

- $\{\text{Cl}^-\}=0.5\text{M}$
- Figure 8.13, pg.403 in Benjamin

Cd limited; no Carbonate

- $10^{-4}\text{M} \text{ Cd}^+$
- Cd(OH)$_2$ (s) allowed
- Figure 8.19, pg.421 in Benjamin

Not really “concentration”, more accurately the mass of precipitate per L solution
CdCO$_3$ (s) low $C_T$

- $C_T=10^{-3} M$
- Figure 8.15, pg.406 in Benjamin

CdCO$_3$ (s) High $C_T$

- $C_T=10^{-1} M$
- Figure 8.17, pg.409 in Benjamin
CdCO₃ (s) Open

- pCO₂ = 10⁻³.₅
- Figure 8.18, pg. 410 in Benjamin

Solid formation
- Open system
**Dual Solids**

- Figs 8.21 & 8.22

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**Open System**

- Equilibrium with $\text{CdCO}_3(s)$
- Equilibrium with $\text{Cd(OH)}_2(s)$
- Both solids supersaturated
- Neither solid supersaturated

**Closed System; $C_T = 10^{-3} \text{M}$**

- $\text{Cd}^{2+}$ limited; no Carbonate
- $10^{-4} \text{M} \text{Cd}_T$
- $\text{Cd(OH)}_2(s)$ allowed
- Figure 8.19, pg. 421 in Benjamin

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Not really “concentration”, more accurately the mass of precipitate per L solution
Cd limited; Closed System

- $10^{-4} M \text{Cd}_T$
- $10^{-3} \text{ CO}_3^2_T$
- Cd(OH)$_2$ (s) & CdCO$_3$ (s) allowed

- Figure 8.23, pg.428 in Benjamin

Not really “concentration”, more accurately the mass of precipitate per L solution

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**3D, 4D, 5D?**

- Fig 8.7 in Benjamin
With $S^{-2}$, low pH

Stumm & Morgan, 1996, Figure 7.19a, pg. 405

With $S^{-2}$, high pH

Stumm & Morgan, 1996, Figure 7.19c, pg. 406
To next lecture