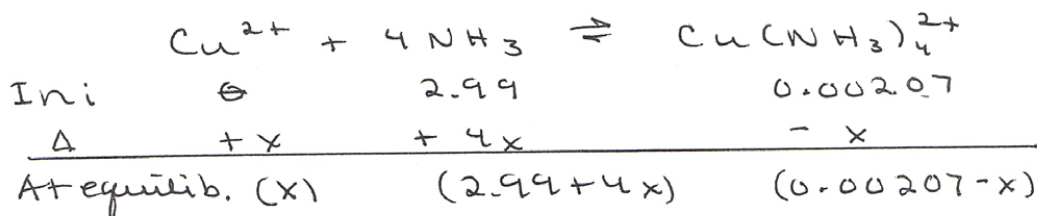
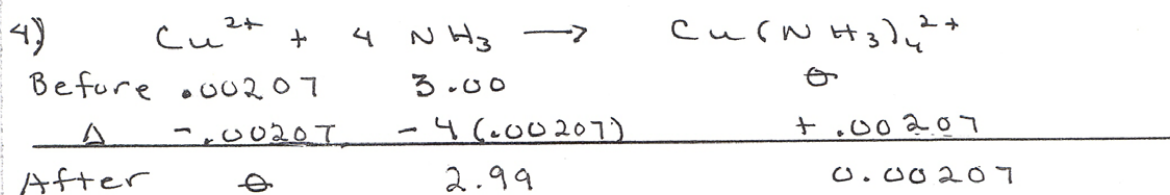


$$K_b = 5. \times 10^9 = \frac{[\text{Co}(\text{OH})_4^{2-}]}{[\text{Co}^{2+}][\text{OH}^-]^4}$$

$$= \frac{(0.0236 - x)}{(x)(0.706 - 4x)^4}$$

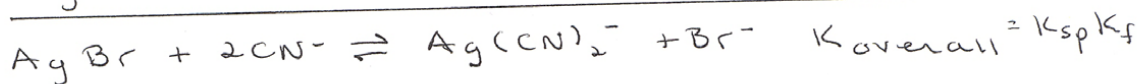
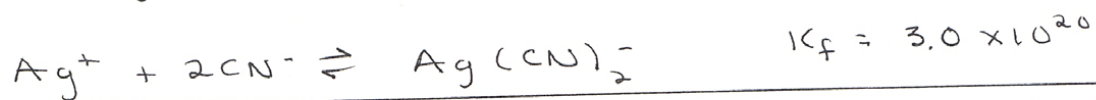
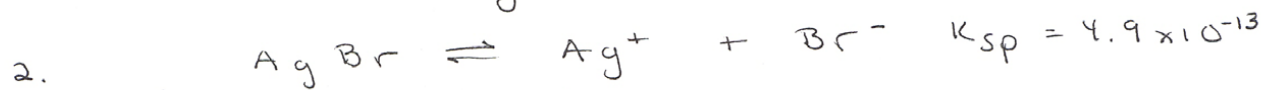
$$[\text{Co}^{2+}] = x = 1.9 \times 10^{-11} \text{ M}$$



$$K_b = 5.6 \times 10^{11} = \frac{[\text{Cu}(\text{NH}_3)_4^{2+}]}{[\text{Cu}^{2+}][\text{NH}_3]^4} = \frac{(0.00207 - x)}{(x)(2.99 + 4x)^4}$$

$$[\text{Cu}^{2+}] = x = 4.6 \times 10^{-17} \text{ M}$$

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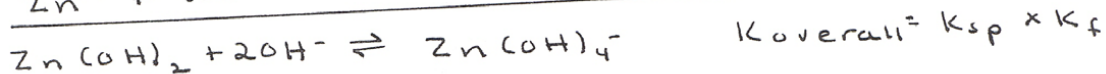
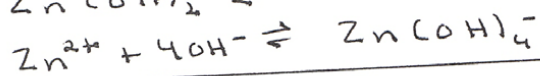
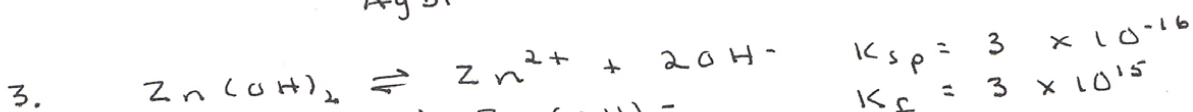
	AgBr	$+ 2\text{CN}^-$	\rightleftharpoons	$\text{Ag}(\text{CN})_2^-$	$+ \text{Br}^-$
Initial	—	1.0		\ominus	\ominus
Δ	—	$-2x$		$+x$	$+x$
At equilib.	—	$1.0 - 2x$		(x)	(x)

$$K_{\text{overall}} = K_{sp} \times K_f = \frac{[\text{Ag}(\text{CN})_2^-][\text{Br}^-]}{[\text{CN}^-]^2}$$

$$(4.9 \times 10^{-13})(3.0 \times 10^{20}) = \frac{(x)(x)}{(1.0 - 2x)^2}$$

$$(1.47 \times 10^8)^{1/2} = \left(\frac{x^2}{(1.0 - 2x)^2} \right)^{1/2}$$

$$S_{\text{AgBr}} : x = 0.498 \text{ M}$$



	$\text{Zn}(\text{OH})_2$	$+ 2\text{OH}^-$	\rightleftharpoons	$\text{Zn}(\text{OH})_4^{2-}$
Ini	—	2.00		\ominus
Δ	—	$-2x$		$+x$
At equilib.	—	$(2.00 - 2x)$		(x)

$$K_{\text{overall}} = K_{sp} \times K_f = \frac{[\text{Zn}(\text{OH})_4^{2-}]}{[\text{OH}^-]^2}$$

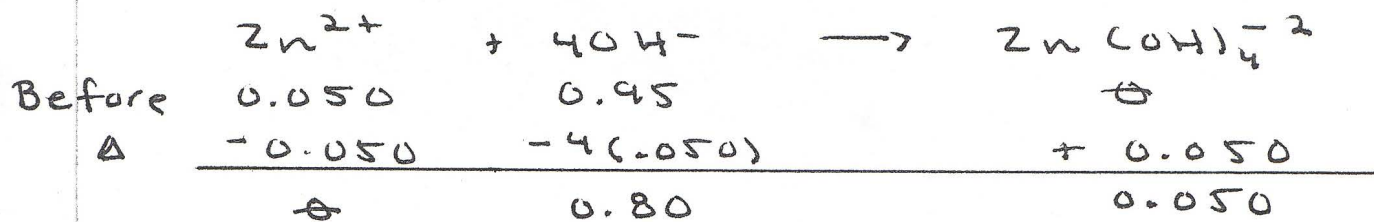
$$(3 \times 10^{-16})(3 \times 10^{15}) = \frac{x}{(2.00 - 2x)^2}$$

= UGH! A mess to solve!
Do not need solve!

5)

$$M_{\text{Zn}^{2+}} = \frac{0.0500 \text{ L} \times \frac{0.10 \text{ mol Zn}^{2+}}{\text{L}}}{0.0500 + 0.0500} = 0.050$$

$$M_{\text{OH}^-} = \frac{0.050 \text{ L} \times \frac{2.00 \text{ mol OH}^-}{\text{L}}}{0.0500 + 0.0500} = 0.95 \text{ M}$$



Initial	0	0.00	0.050
Δ	+x	+4x	-x
At equilibrium	x	(0.80 + 4x)	(0.0500 - x)

$$K_b = 3 \times 10^{-5} = \frac{[Zn(OH)_4^{2-}]}{[Zn^{2+}][OH^-]^4}$$

$$= \frac{(0.0500 - x)^{\rightarrow \text{neg}}}{(x)(0.80 + 4x)^4_{\rightarrow \text{neg}}}$$

$$3 \times 10^{-5} = \frac{0.0500}{(x)(0.80)^4}$$

$$[Zn^{2+}] = x = 4.1 \times 10^{-17} M$$