crystals

MDPI

Supporting Information

Hydrothermal synthesis of (001) facet highly exposed ZnO plates: A new insight into the effect of citrate

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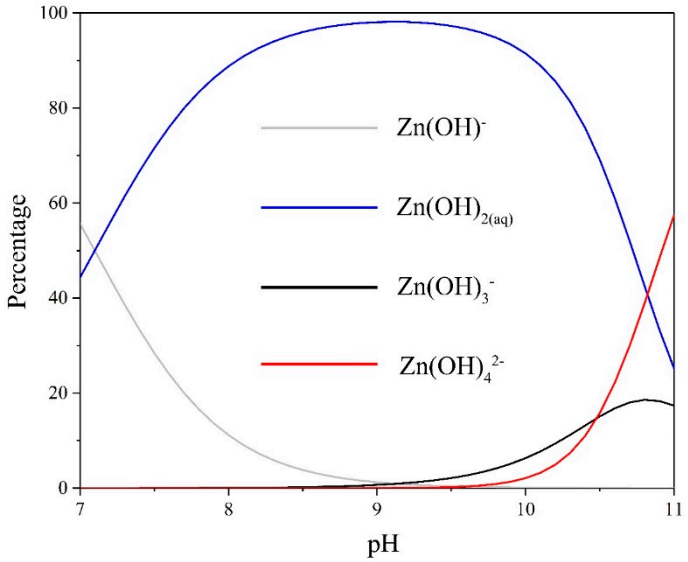

Figure 1. Distribution of Zn^{2+}-OH^--H_2O system.

The distribution of Zn^{2+}-OH^--H_2O system was calculated according to the equation (4), (10)-(13) and the corresponding complex constant. The distribution can be calculated according to the equation:

$$[Zn(OH)_x^{2-x}] = K_{Zn(OH)_x^{2-x}} \cdot [Zn^{2+}][OH^-]^x$$

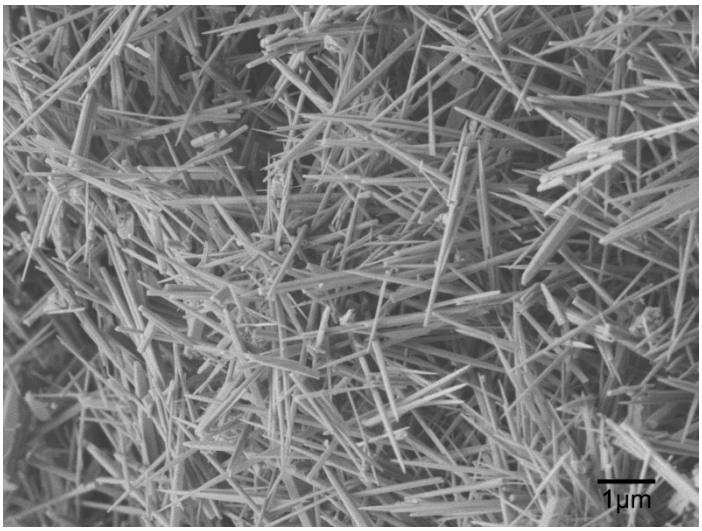

Figure 2. SEM image of ZnO nanorods.

Table 1. Equilibrium equation and complex constant for Zn^{2+}-$C_6H_5O_7^{3-}$-H_2O system(25℃).

	Equilibrium Equation	Complex Constant
1	$ZnSO_{4(aq)} = SO_4^{2-} + Zn^{2+}$	1.08×10^{0}
2	$H_2SO_4 = H^+ + HSO_4^-$	7.76×10^{1}
3	$HSO_4^- = H^+ + SO_4^{2-}$	1.21×10^{-2}
4	$H_2O = H^+ + OH^-$	1.02×10^{-14}
5	$C_6H_8O_7 = C_6H_7O_7^- + H^+$	7.45×10^{-4}
6	$C_6H_7O_7^- = C_6H_6O_7^{2-} + H^+$	1.73×10^{-5}
7	$C_6H_6O_7^{2-} = C_6H_5O_7^{3-} + H^+$	4.02×10^{-7}
8	$Zn^{2+} + C_6H_6O_7^{2-} = Zn^{2+}\text{-}C_6H_6O_7^{2-}$	5.13×10^{4}
9	$Zn^{2+} + C_6H_5O_7^{3-} = Zn^{2+}\text{-}C_6H_5O_7^{3-}$	2.51×10^{11}
10	$Zn^{2+} + OH^- = Zn(OH)^+$	2.51×10^{4}
11	$Zn^{2+} + 2OH^- = Zn(OH)_{2(aq)}$	2.00×10^{11}
12	$Zn^{2+} + 3OH^- = Zn(OH)_3^-$	1.38×10^{14}
13	$Zn^{2+} + 4OH^- = Zn(OH)_4^{2-}$	4.57×10^{17}