61. (b) CH_3COONa is a salt of weak acid and strong base. Hence its aqueous solution is alkaline.

62. (b) $BaSO_4 \rightleftharpoons Ba^{2+} + SO_4^{--}$

Solubility constant $= S \times S$

$1.5 \times 10^{-19} = S^2; S = \sqrt{1.5 \times 10^{-19}}; S = 3.9 \times 10^{-5}$

63. (a) In a strongly acidic solution, very few S^{2-} ions are available because H_2S does not ionize completely.
Since precipitation of CdS needs S^{2-} ions, it does not precipitate.
(a) Due to common ion effect *(very low S^{2-} concentration in acidic medium)*

64. (c) Dilution increases ionization
So $[H^+]$ decreases but ionization % increases
Ka remains constant (depends only on temperature)
(c) Percentage ionization will increase

65. (d) $Ca(OH)_2 \rightleftharpoons \underset{(S)}{Ca^{++}} + \underset{(2S)^2}{2OH^-}$

$K_{sp} = 4S^3 = 4 \times \sqrt{3} \times \sqrt{3} \times \sqrt{3} = 12\sqrt{3}$

66. (a) Due to common ion effect.

67. (d) $PbCl_2 \rightleftharpoons \underset{(S)}{Pb^{2+}} + \underset{(2S)^2}{2Cl^-}$

$K_{sp} = 4S^3 = 4 \times (2 \times 10^{-2})^3 = 3.2 \times 10^{-5}$

68. (a) $Ag_2S \rightleftharpoons 2Ag^+ + S^{--}$

$K_{sp} = 4S^3$

$\boldsymbol{S = \sqrt[3]{\frac{K_{sp}}{4}} = \sqrt[3]{\frac{3.2\times10^{-11}}{4}} = 2 \times 10^{-6}}$

69. (d) $\underset{S}{CaCO_3} \rightleftharpoons \underset{S}{Ca^{++}} + \underset{S}{CO_3^{--}}$

Solubility product of $CaCO_3$

$K_{sp} = S^2; S = \sqrt{K_{sp}}$

It is a binary electrolyte.

$S^2 = K_{sp}; (3.05 \times 10^{-4})^2 = K_{sp}; K_{sp} = 9.3 \times 10^{-8}$

70. Dissociation of BaF_2:

$BaF_2 \rightleftharpoons Ba^{2+} + 2F^-$

Let solubility = S

Then:

$[Ba^{2+}] = S$

$[F^-] = 2S$

But $Ba(NO_3)_2$ already provides Ba^{2+} ions, so Ba^{2+} is a common ion.

Due to the common ion effect, solubility is reduced, and we express solubility using F^- only

71. (c) $PbCl_2 \rightarrow \underset{S}{Pb^{++}} + \underset{2S}{2Cl^-}$

$\boldsymbol{K_{sp} = S \times (2S)^2 = [6.3 \times 10^{-3}] \times [12.6 \times 10^{-3}]^2.}$

72. (d) A salt of strong acid and strong base cannot be hydrolysed. In this case the equilibrium cannot shifted towards the backward.

73. (d) If we mixed any substance into the solution. Then the value of pH is increased these substance is a salt of weak acid and strong base.

74. (d) It is a salt of strong base and weak acid.

75. (a) $K_{sp} = 4s^3 = 4 \times [2.5 \times 10^{-2}]^3 = 62.5 \times 10^{-6}$.

76. (c) $NaCl \rightleftharpoons \underset{S}{Na^+} + \underset{S}{Cl^-}$

$\boldsymbol{K_{sp} = S^2}$, $\boldsymbol{S = \sqrt{K_{sp}} = \sqrt{36} = 6}$.

78. (d) $\underset{K_{sp}}{PbI_2} \rightleftharpoons \underset{S}{Pb^{++}} + \underset{2S}{2I^-}$

$K_{sp} = 4S^3 = 4 \times [2 \times 10^{-3}]^3 = \boldsymbol{32 \times 10^{-9}}$.

79. (b) When ionic product is greater than K_{sp} then precipitation occur

$K_{sp} < 10^{-2}MCa^{2+} + 10^{-3}MF^-$

80. (d) In IV[th] group the S^{2-}concentration increase when added the NH_4OHbecause

$NH_4OH \rightleftharpoons NH_4^+ + OH^-$
$H_2S \rightleftharpoons 2H^+ + S^{2-}$

$OH^- + H^+ \rightleftharpoons H_2O$. So that $S^{2-}$is increased.