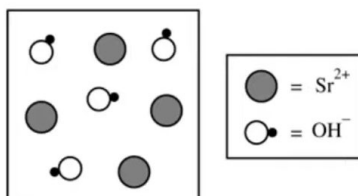
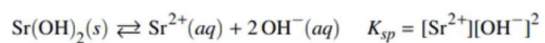


2023 FRQ #7

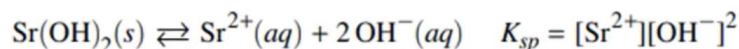
7. Strontium hydroxide dissolves in water according to the following equation. The K_{sp} expression for strontium hydroxide is provided.



a) A student draws the particulate diagram shown to represent the ions present in an aqueous solution of $\text{Sr}(\text{OH})_2$. (Water molecules are intentionally omitted.) Identify the error in the student's drawing.

b) The student prepares a saturated solution by adding excess $\text{Sr}(\text{OH})_{2(s)}$ to distilled water and stirring until no more solid dissolves. The student then determines that $[\text{Sr}^{2+}] = 0.043 \text{ M}$ in the solution.

(i) Calculate the value of $[\text{OH}^-]$ in the solution.



(ii) Calculate the value of K_{sp} for $\text{Sr}(\text{OH})_2$.

c) The student prepares a second saturated solution of $\text{Sr}(\text{OH})_2$ in aqueous $0.10 \text{ M Sr}(\text{NO}_3)_2$ instead of water. Will the value of $[\text{OH}^-]$ in the second solution be greater than, less than, or equal to the value in the first solution? Justify your answer. (Assume constant temperature.)