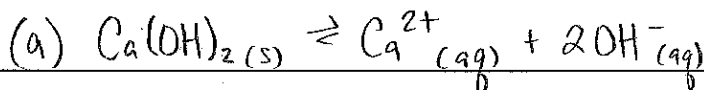
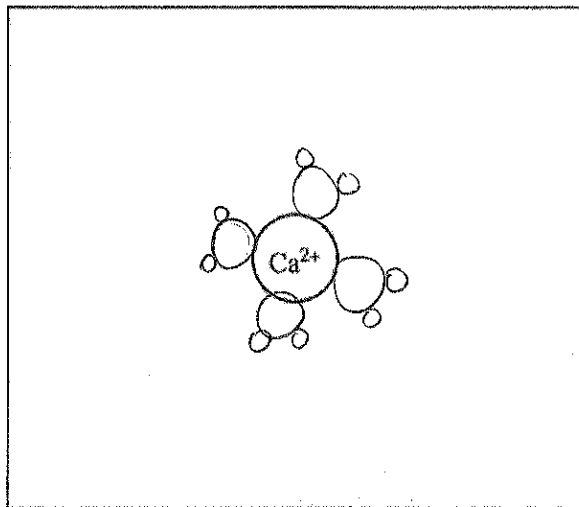


AP Free Response Practice #4 [2015, 4 points]

- 4.)
 ✗ Answer the following questions about the solubility of $\text{Ca}(\text{OH})_2$ ($K_{sp} = 1.3 \times 10^{-6}$). (2015)
- (a) ✗ Write a balanced chemical equation for the dissolution of $\text{Ca}(\text{OH})_2$ in pure water. [1 point]
- (b) ✗ Calculate the molar solubility of $\text{Ca}(\text{OH})_2$ in 0.10 M $\text{Ca}(\text{NO}_3)_2$. [2 points]
- (c) ✗ In the box below, complete a particle representation diagram that includes four water molecules with proper orientation around the Ca^{2+} ion. [1 point]

Represent water molecules as



(b)	I	0.10	\emptyset
	C	$+x$	$+2x$
	E	$0.10+x$	$2x$

$$K_{sp} = [\text{Ca}^{2+}][\text{OH}^{-}]^2 = (0.10+x)(2x)^2 \approx (0.10)4x^2 = 0.40x^2$$

x negligible, b/c
 $0.10 > 1000(1.3 \times 10^{-6})$

$$1.3 \times 10^{-6} = 0.40x^2 \Rightarrow x = \sqrt{\frac{1.3 \times 10^{-6}}{0.40}} = \boxed{0.0018 \text{ M}}$$