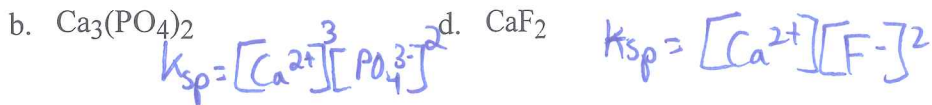
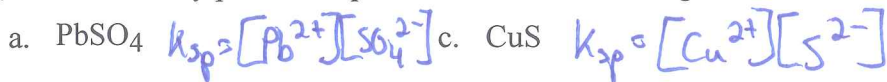
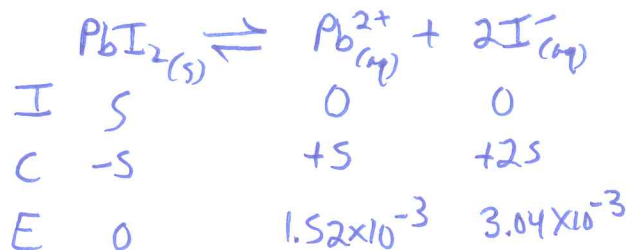


1) Write solubility product expressions for the following salts:



2) The molar solubility of PbI_2 is $1.52 \times 10^{-3} \text{ M}$. Calculate the value of K_{sp} for PbI_2 .

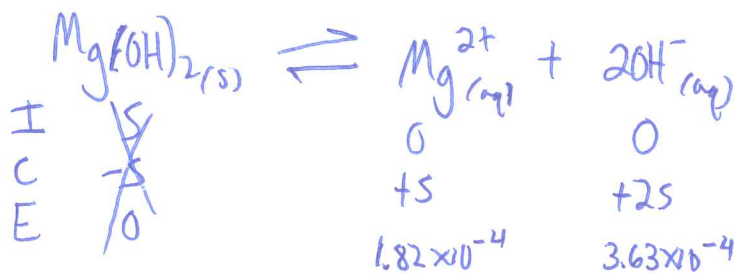
- A) 3.51×10^{-9}
- B) 4.62×10^{-6}
- C) 1.40×10^{-8}
- D) 1.52×10^{-3}
- E) none of these



$$K_{sp} = (1.52 \times 10^{-3})(3.04 \times 10^{-3})^2 = \boxed{1.40 \times 10^{-8}}$$

3) The concentration of OH^- in a saturated solution of $\text{Mg}(\text{OH})_2$ is $3.63 \times 10^{-4} \text{ M}$. The K_{sp} of $\text{Mg}(\text{OH})_2$ is

- A) 6.6×10^{-8}
- B) 4.8×10^{-11}
- C) 1.3×10^{-7}
- D) 3.6×10^{-4}
- E) 2.4×10^{-11}



$$K_{sp} = (1.82 \times 10^{-4})(3.63 \times 10^{-4})^2 = \boxed{2.4 \times 10^{-11}}$$

4) Calculate the concentration of the silver ion in a saturated solution of silver chloride, AgCl ($K_{sp} = 1.57 \times 10^{-10}$).

- A) 1.25×10^{-5}
- B) 1.25×10^{-5}
- C) 2.46×10^{-20}
- D) 3.14×10^{-10}
- E) none of these



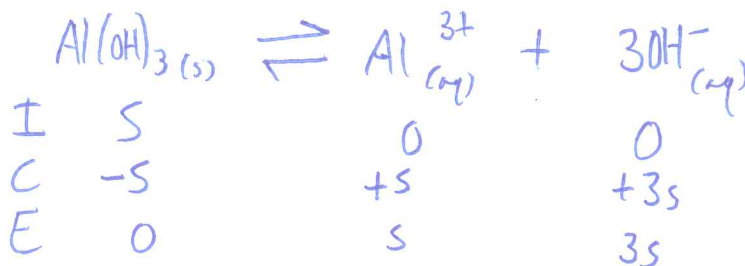
1:1

$$K_{sp} = s^2 = 1.57 \times 10^{-10}$$

$$s = \boxed{1.25 \times 10^{-5}}$$

5) Calculate the concentration of Al^{3+} in a saturated aqueous solution of $\text{Al}(\text{OH})_3$ ($K_{sp} = 2.2 \times 10^{-32}$).

- A) 7.0×10^{-9}
- B) 2.0×10^{-34}
- C) 1.2×10^{-8}
- D) 8.1×10^{-34}
- E) 5.3×10^{-9}



$$K_{sp} = (s)(3s)^3 = 2.2 \times 10^{-32}$$

$$s = \boxed{5.3 \times 10^{-9}}$$

(For #6) Solubility Products (K_{sp})

BaSO_4	1.5×10^{-9}	1:1
CoS	5.0×10^{-22}	
PbSO_4	1.3×10^{-8}	
AgBr	5.0×10^{-13}	
BaCO_3	1.6×10^{-9}	

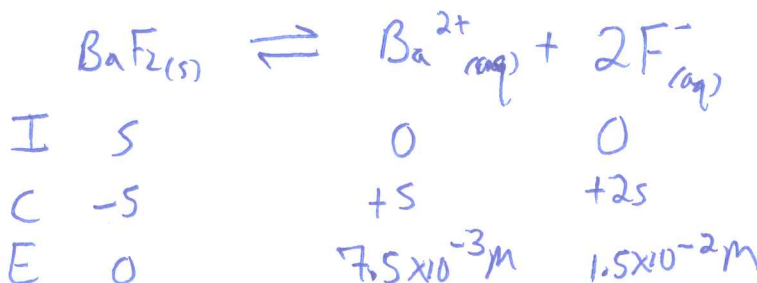
6) Which of the following compounds is the most soluble (in moles/liter)?

- A) BaSO_4
- B) CoS
- C) PbSO_4
- D) AgBr
- E) BaCO_3

7) What is the relationship for Al_2S_3 ? $K_{sp} = [\text{Al}^{3+}]^2[\text{S}^{2-}]^3 = (2s)^2(3s)^3 = \boxed{108 s^5}$

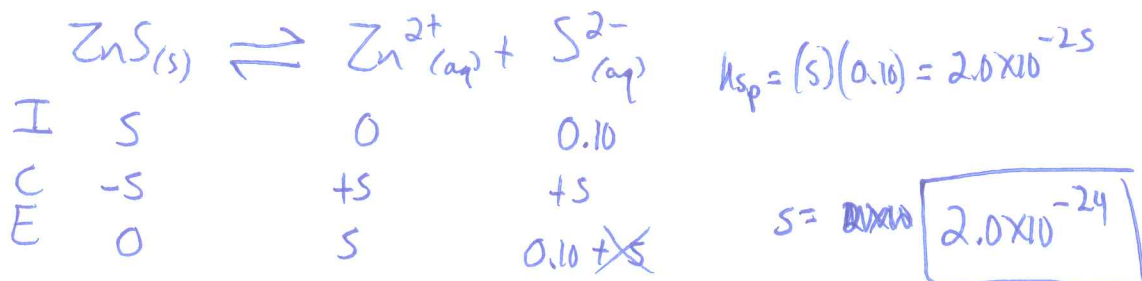
8) What is the relationship for Ag_3PO_4 ? $K_{sp} = [\text{Ag}^+]^3[\text{PO}_4^{3-}] = (3s)^3(s) = \boxed{27 s^4}$

9) The $[\text{F}^-]$ in a saturated solution of BaF_2 is $1.5 \times 10^{-2} \text{ M}$. What is the K_{sp} of BaF_2 ?

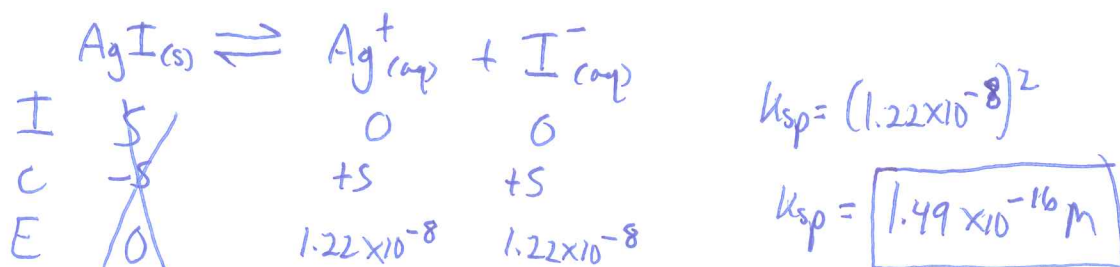


$$K_{sp} = (7.5 \times 10^{-3})(1.5 \times 10^{-2})^2 = \boxed{1.69 \times 10^{-6}}$$

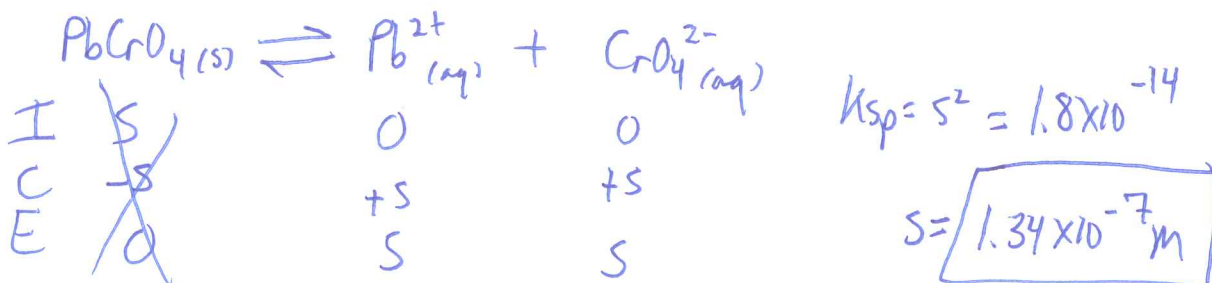
10) The K_{sp} of ZnS is 2.0×10^{-25} . What is the molar solubility of ZnS in 0.10 M K_2S ?



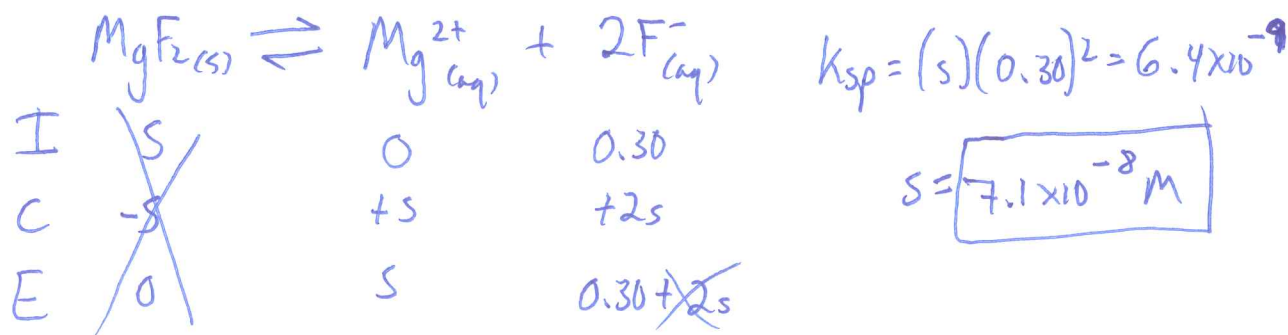
11) If the molar solubility of silver iodide is 1.22×10^{-8} M, what is the solubility product for AgI?



12) What is the concentration of CrO_4^{2-} in a saturated solution of PbCrO_4 ?
 $K_{sp} = 1.8 \times 10^{-14}$?



13) What is the $[\text{Mg}^{2+}]$ in a saturated solution of magnesium fluoride, MgF_2 if its solubility product constant is 6.4×10^{-9} ? The solution also contains 0.30 M sodium fluoride?



Go Vikings!!