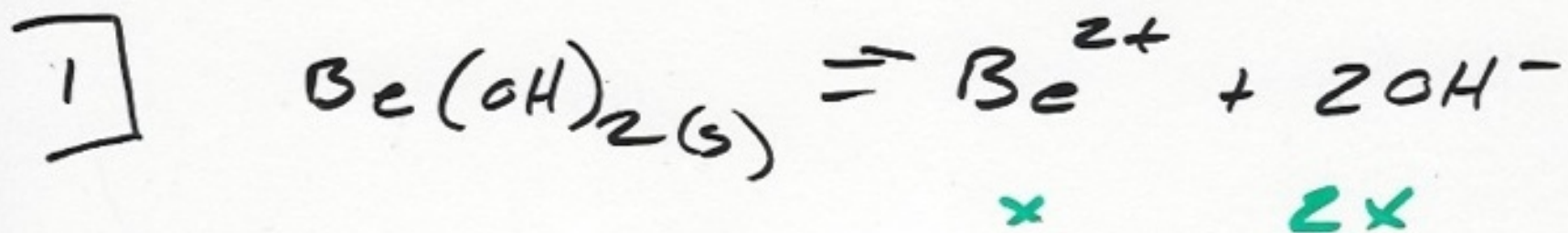


Table A-10

Solubility Product Constants (at 25°C)					
Substance	$K_{sp}$	Substance	$K_{sp}$	Substance	$K_{sp}$
AgBr	$5.01 \times 10^{-13}$	BaSO <sub>4</sub>	$1.10 \times 10^{-10}$	Li <sub>2</sub> CO <sub>3</sub>	$2.51 \times 10^{-2}$
AgBrO <sub>3</sub>	$5.25 \times 10^{-5}$	CaCO <sub>3</sub>	$2.88 \times 10^{-9}$	MgCO <sub>3</sub>	$3.47 \times 10^{-8}$
Ag <sub>2</sub> CO <sub>3</sub>	$8.13 \times 10^{-12}$	CaSO <sub>4</sub>	$9.12 \times 10^{-6}$	MnCO <sub>3</sub>	$1.82 \times 10^{-11}$
AgCl	$1.78 \times 10^{-10}$	CdS	$7.94 \times 10^{-27}$	NiCO <sub>3</sub>	$6.61 \times 10^{-9}$
Ag <sub>2</sub> CrO <sub>4</sub>	$1.12 \times 10^{-12}$	Cu(IO <sub>3</sub> ) <sub>2</sub>	$7.41 \times 10^{-8}$	PbCl <sub>2</sub>	$1.62 \times 10^{-5}$
Ag <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	$2.00 \times 10^{-7}$	CuC <sub>2</sub> O <sub>4</sub>	$2.29 \times 10^{-8}$	PbI <sub>2</sub>	$7.08 \times 10^{-9}$
AgI	$8.32 \times 10^{-17}$	Cu(OH) <sub>2</sub>	$2.19 \times 10^{-20}$	Pb(IO <sub>3</sub> ) <sub>2</sub>	$3.24 \times 10^{-13}$
AgSCN	$1.00 \times 10^{-12}$	CuS	$6.31 \times 10^{-36}$	SrCO <sub>3</sub>	$1.10 \times 10^{-10}$
Al(OH) <sub>3</sub>	$1.26 \times 10^{-33}$	FeC <sub>2</sub> O <sub>4</sub>	$3.16 \times 10^{-7}$	SrSO <sub>4</sub>	$3.24 \times 10^{-7}$
Al <sub>2</sub> S <sub>3</sub>	$2.00 \times 10^{-7}$	Fe(OH) <sub>3</sub>	$3.98 \times 10^{-38}$	TlBr	$3.39 \times 10^{-6}$
BaCO <sub>3</sub>	$5.13 \times 10^{-9}$	FeS	$6.31 \times 10^{-18}$	ZnCO <sub>3</sub>	$1.45 \times 10^{-11}$
BaCrO <sub>4</sub>	$1.17 \times 10^{-10}$	Hg <sub>2</sub> SO <sub>4</sub>	$7.41 \times 10^{-7}$	ZnS	$1.58 \times 10^{-24}$

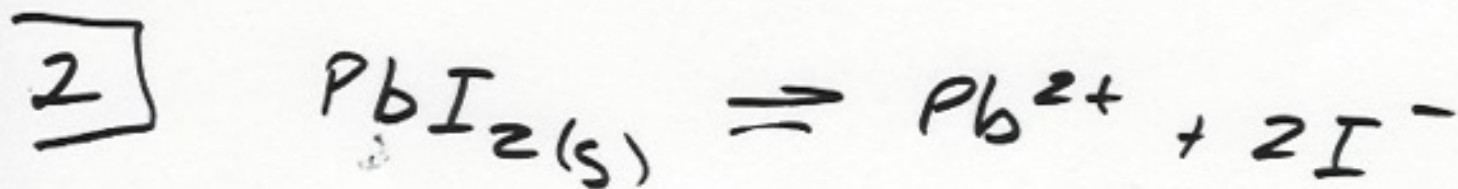
- What is the concentration of Be<sup>2+</sup> in a saturated solution of Be(OH)<sub>2</sub>?  
 $K_{sp} = 1.58 \times 10^{-22}$
- A saturated solution of PbI<sub>2</sub> has a lead ion concentration of  $1.21 \times 10^{-3} M$ . What is  $K_{sp}$  for PbI<sub>2</sub>?
- If [D<sup>+</sup>] is  $2.00 \times 10^{-6} M$  at equilibrium, what is the  $K_{sp}$  for D<sub>2</sub>A?
- Will a precipitate form if 0.500 dm<sup>3</sup> of 0.100M LiCl solution is added to 0.500 dm<sup>3</sup> of 0.100M Na<sub>2</sub>CO<sub>3</sub>? Show all of your calculations. Use Appendix Table A-10.
- If 250.0 cm<sup>3</sup> of 0.100M FeCl<sub>3</sub> solution are added to 250.0 cm<sup>3</sup> of 0.010M NaOH solution, will a precipitate form? Show all of your calculations. Use Appendix Table A-10.



$$K_{sp} = [\text{Be}^{2+}][\text{OH}^-]^2 = (x)(2x)^2$$

$$1.58 \times 10^{-22} = 4x^3$$

$$[\text{Be}^{2+}] = x = 3.4 \times 10^{-8} \text{ M}$$

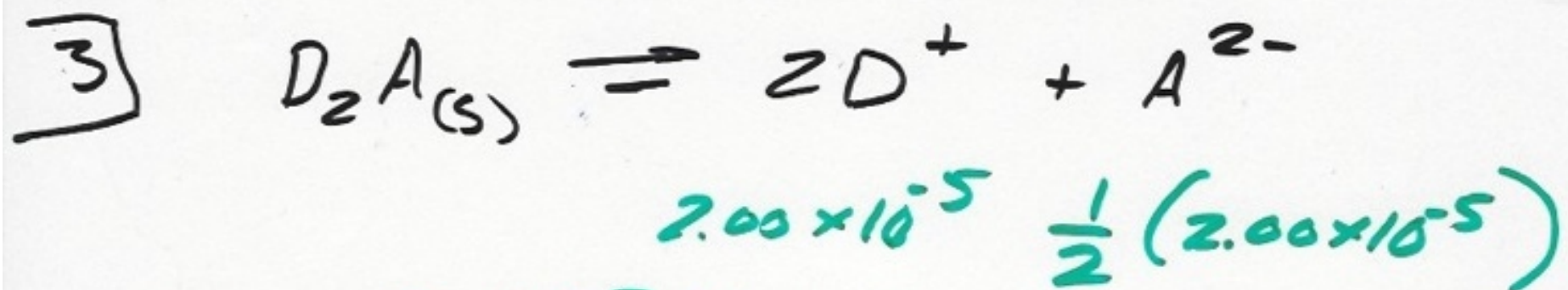


$1.2 \times 10^{-3} \qquad 2(1.2 \times 10^{-3})$

$$K_{sp} = (1.2 \times 10^{-3})(2.4 \times 10^{-3})^2$$

$$= 6.9 \times 10^{-9}$$





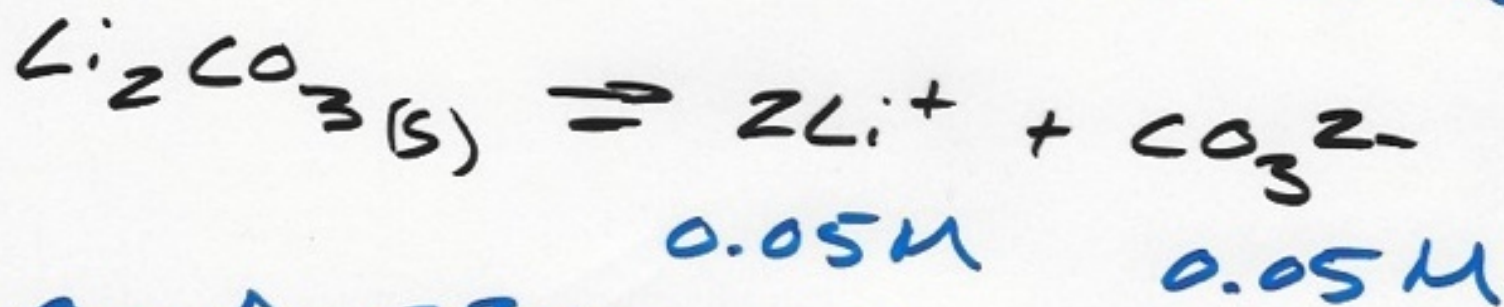
$$K_{sp} = [D^+]^2 [A^{2-}]$$

$$= (2.00 \times 10^{-5})^2 (1.00 \times 10^{-5})$$

$$= 4.00 \times 10^{-15}$$

$$4] \quad 0.5L \times \frac{0.1 \text{ mol } Li^+}{1L} = \frac{0.05 \text{ mol } Li^+}{0.5L + 0.5L}$$

$$0.5L \times \frac{0.1 \text{ mol } CO_3^{2-}}{1L} = \frac{0.05 \text{ mol } CO_3^{2-}}{0.5L + 0.5L}$$



$$Q = [Li^+]^2 [CO_3^{2-}]$$

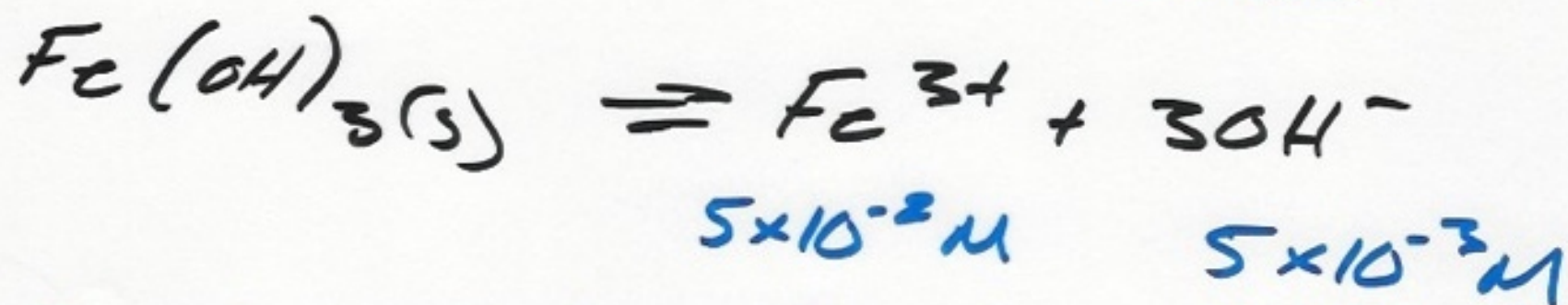
$$= (0.05)(0.05)^2$$

$$= 1.25 \times 10^{-4} < K = 2.5 \times 10^{-2}$$

No precipitation

$$\boxed{5} \quad 0.250L \times \frac{0.1 \text{ mol Fe}^{3+}}{1L} = \frac{0.25 \text{ mol Fe}^{3+}}{0.5L}$$

$$0.250L \times \frac{0.01 \text{ mol OH}^-}{1L} = \frac{2.5 \times 10^{-3} \text{ mol OH}^-}{0.5L}$$



$$Q = [\text{Fe}^{3+}][\text{OH}^-]^3$$

$$= (5 \times 10^{-2})(5 \times 10^{-3})^3$$

$$= 6.3 \times 10^{-9} > K_{sp} = 3.98 \times 10^{-38}$$

a precipitate  
will form

