

Multiple Choice Response Sheet

1. C

2. A

3. C

4. C

5. D

6. C

7. A

8. C

9. C

10. B

11. B

12. A

13. D

14. A

15. C

16. D

17. B

18. D

19. D

20. A

21. D

22. C

23. B

24. A

25. B

26. D

27. A acid-base question

28. B

29. _____

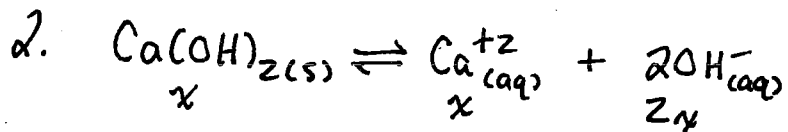
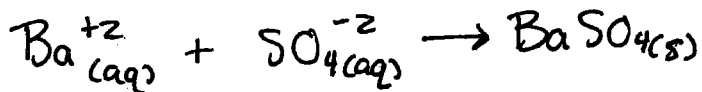
30. _____

31. _____

32. _____

40

1. BaSO_4 is the precipitate



$$K_{sp} = [\text{Ca}^{+2}][\text{OH}^{-}]^2 = 1.3 \times 10^{-6}$$

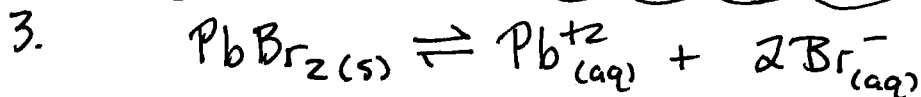
$$1.3 \times 10^{-6} = (x)(2x)^2$$

$$x = \sqrt[3]{\frac{1.3 \times 10^{-6}}{4}}$$

$$x = 6.87 \dots \times 10^{-3} \text{ mol/L} \\ = [\text{Ca(OH)}_2]$$

$$6.87 \dots \times 10^{-3} \frac{\text{mol Ca(OH)}_2}{\text{L}} \times \frac{74.1 \text{ g}}{1 \text{ mol}} \times 5.0 \text{ L}$$

$$= \cancel{\text{XXXXXXXXXX}} \text{ g Ca(OH)}_2 \quad 2.5 \text{ g Ca(OH)}_2$$



$$Q = [\text{Pb}^{+2}][\text{Br}^{-}]^2$$

$$[\text{Pb}^{+2}] \\ = \frac{(1.0 \times 10^{-3} \text{ M})(2.0 \text{ mL})}{5.0 \text{ mL}} \\ = 4 \times 10^{-4} \text{ M}$$

$$[\text{Br}^{-}] \\ = \frac{(1.0 \times 10^{-3} \text{ M})(3.0 \text{ mL})}{5.0 \text{ mL}} \\ = 6 \times 10^{-4} \text{ M}$$

$$Q = (4.0 \times 10^{-4} \text{ M})(6.0 \times 10^{-4} \text{ M})^2$$

$$Q = 1.44 \times 10^{-10}$$

$$K_{sp} = 6.6 \times 10^{-6}$$

$Q < K_{sp}$ ∴ no precipitate will form

Multiple Choice Response Sheet

1. B

2. C

3. B

4. A

5. A

6. A

7. D

8. A

9. D

10. C

11. C

12. B

13. D

14. B

15. B

16. C

17. D

18. D

19. C

20. B

21. C

22. D

23. B

24. D

25. D

26. D

27. C

28. A

29. C

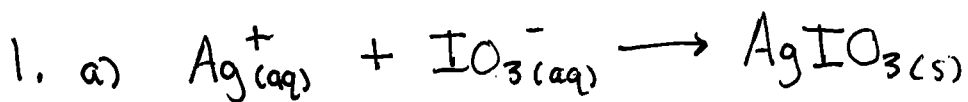
30. C

31. A acid-base question

32. _____

40

Solubility



$$b) Q = [\text{Ag}^+][\text{IO}_3^-]$$

$$\begin{aligned} [\text{Ag}^+] &= \frac{(0.50\text{M})(35.0\text{mL})}{50.0\text{mL}} \\ &= 0.35\text{M} \end{aligned}$$

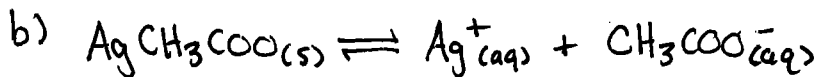
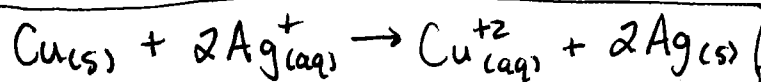
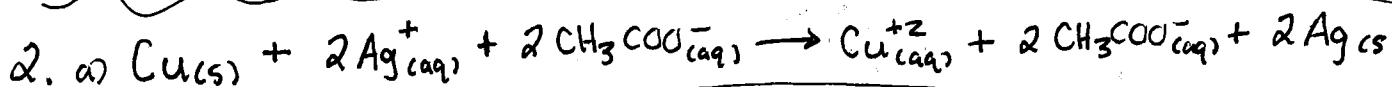
$$\begin{aligned} [\text{IO}_3^-] &= \frac{(0.50\text{M})(15.0\text{mL})}{50.0\text{mL}} \\ &= 0.15\text{M} \end{aligned}$$

$$\begin{aligned} Q &= (0.35\text{M})(0.15\text{M}) \\ Q &= 5.3 \times 10^{-2} \end{aligned}$$

$$K_{sp} = 3.2 \times 10^{-8}$$

AgIO₃

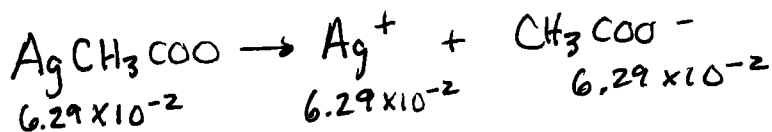
$Q > K_{sp}$ \therefore a precipitate will form to reduce the amount of ions



$$K_{sp} = [\text{Ag}^+][\text{CH}_3\text{COO}^-]$$

$$\frac{2.00\text{g Cu}}{1.00\text{L}} \times \frac{1\text{ mol Cu}}{63.546\text{g Cu}} \times \frac{2\text{ mol AgCH}_3\text{COO}}{1\text{ mol Cu}} = 6.29... \times 10^{-2}\text{M}$$

$$[\text{AgCH}_3\text{COO}] = 6.29... \times 10^{-2}\text{M}$$



$$K_{sp} = (6.29... \times 10^{-2}\text{M})(6.29... \times 10^{-2}\text{M})$$

$$K_{sp} = 3.96 \times 10^{-3}$$

Multiple Choice Response Sheet

Name: _____

1. D

2. D

3. A

4. C

5. B

6. D

7. A

8. B

9. D

10. B

11. C

12. A

13. A

14. A

15. A

16. D

17. C

18. D

19. D

20. D

21. B

22. A

23. D

24. C

25. C

26. C

27. B

28. B

29. D

30. _____

31. _____

32. _____

33. _____

34. _____

35. _____

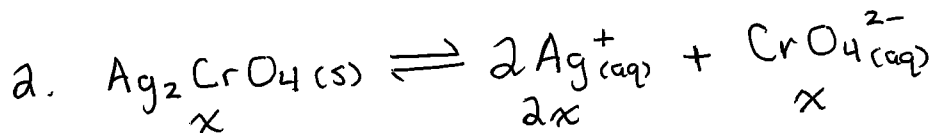
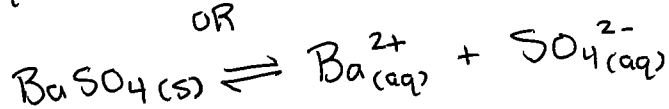
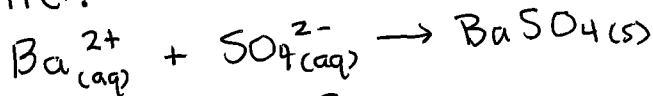
36. _____

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Solubility

1. precipitate: BaSO_4

Net ionic:



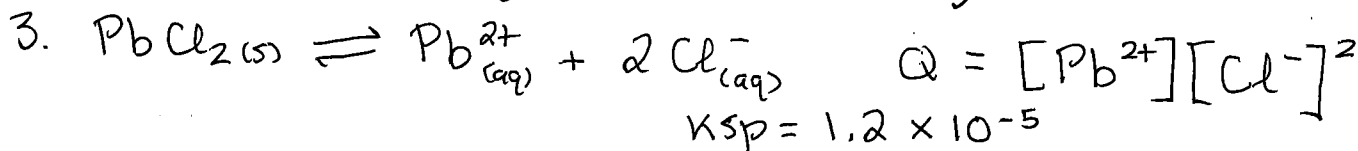
$$K_{\text{sp}} = [\text{Ag}^+]^2 [\text{CrO}_4^{2-}] = 1.1 \times 10^{-12}$$

$$(2x)^2 (x) = 1.1 \times 10^{-12}$$

$$x = \sqrt[3]{\frac{1.1 \times 10^{-12}}{4}} = 6.502 \dots \times 10^{-5}$$

$$[\text{Ag}_2\text{CrO}_4] = 6.50 \dots \times 10^{-5} \frac{\text{mol}}{\text{L}} \times \frac{331.8 \text{ g}}{1 \text{ mol}} \times 0.125 \text{ L} = 2.697 \dots \times 10^{-3}$$

$$\text{mass Ag}_2\text{CrO}_4 = 2.7 \times 10^{-3} \text{ g}$$



$$[\text{Pb}(\text{NO}_3)_2] = [\text{Pb}^{2+}]$$

$$= \frac{(1.0 \text{ M})(10.0 \text{ mL})}{50.0 \text{ mL}}$$

$$= 0.20 \text{ M}$$

$$[\text{NaCl}] = [\text{Cl}^-]$$

$$= \frac{(2.0 \times 10^{-2} \text{ M})(40.0 \text{ mL})}{50.0 \text{ mL}}$$

$$= 0.016 \text{ M}$$

$$Q = [\text{Pb}^{2+}][\text{Cl}^-]^2$$

$$= (0.20 \text{ M})(0.016 \text{ M})^2$$

$$Q = 5.12 \times 10^{-5}$$

$Q > K_{\text{sp}} \therefore$ a precipitate will form

Multiple Choice Response Sheet

Name: Key

1. D

2. C

3. C

4. D

5. C

6. C

7. D

8. D

9. B

10. C

11. C

12. A

13. D

14. D

15. A

16. A ~~AAAAA~~

17. B

18. A

temp. has →
not changed.

19. A

20. D

21. C

22. A

23. B

~~24. C~~ acid base ques.

25. C

26. B

27. B

28. _____

29. _____

30. _____

31. _____

32. _____

33. _____

34. _____

35. _____

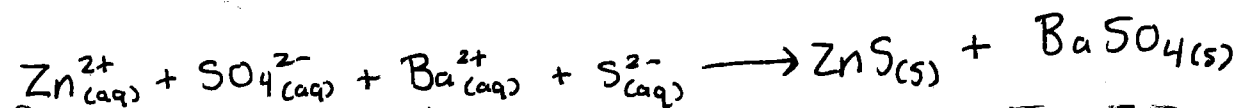
36. _____

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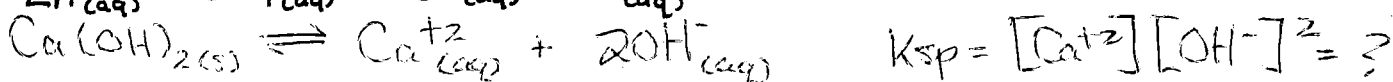
Solubility

~~remove (any question) from base~~

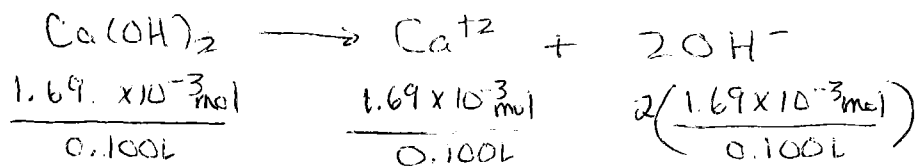
1.



2.

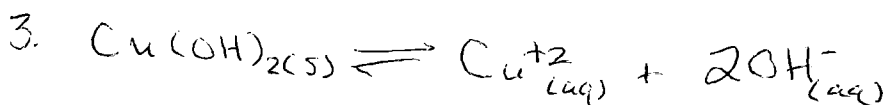


$$0.125 \text{ g Ca}(\text{OH})_2 \times \frac{1 \text{ mol}}{74.1 \text{ g Ca}(\text{OH})_2} = 1.686 \dots \times 10^{-3} \text{ mol Ca}(\text{OH})_2$$



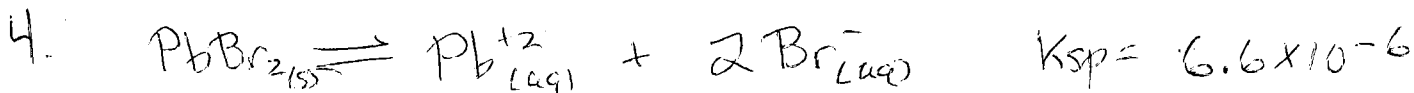
$$K_{sp} = (1.69 \times 10^{-2} \text{ M})(3.4 \times 10^{-2} \text{ M})^2 = 1.92 \times 10^{-5}$$

$$K_{sp} = 1.92 \times 10^{-5}$$



$$K_{sp} = [\text{Cu}^{2+}][\text{OH}^{-}]^2 = 1.6 \times 10^{-19}$$

$$[\text{OH}^{-}] = \sqrt{\frac{1.6 \times 10^{-19}}{0.20 \text{ M}}} = 8.9 \times 10^{-10} \text{ M}$$



$$Q = [\text{Pb}^{2+}][\text{Br}^{-}]^2$$

$$Q = \left(\frac{(1.0 \times 10^{-3} \text{ M})(2.0 \text{ mL})}{5.0 \text{ mL}} \right) \left(\frac{(1.0 \times 10^{-3} \text{ M})(3.0 \text{ mL})}{5.0 \text{ mL}} \right)^2$$

$$Q = 1.44 \times 10^{-10}$$

$Q < K_{sp}$ ∴ no ppt will form.