reaction vessel for further oxidation to the acid.

A = correct conditions, **M** = 4 correct explanation

Test yourself 10A

1 a $SrF_2(s) \rightleftharpoons Sr^{2+}(aq) + 2F^-(aq)$

b $s = 0.012$ g per 100 g of water

$= 0.12$ g L^{-1}

$= 9.6 \times 10^{-4}$ mol L^{-1}

c $[Sr^{2+}] = 9.6 \times 10^{-4}$ mol L^{-1}, $[F^-] = 2 \times 9.6 \times 10^{-4}$ mol L^{-1}

d $K_s = [Sr^{2+}][F^-]^2$

$= [9.6 \times 10^{-4}][2 \times 9.6 \times 10^{-4}]^2$

$= 3.5 \times 10^{-9}$ **3**

2 a $M(AgI) = 234.77$ g mol^{-1}

$$\text{solubility} = \frac{2.8 \times 10^{-6} \text{ g L}^{-1}}{234.77 \text{ g mol}^{-1}}$$

$= 1.19 \times 10^{-8}$ mol L^{-1}

b $AgI(s) \rightleftharpoons Ag^+(aq) + I^-(aq)$

c $K_s = [Ag^+][I^-]$

d $[Ag^+] = [I^-] = 1.19 \times 10^{-8}$

$K_s = (1.19 \times 10^{-8})^2$

$= 1.4 \times 10^{-16}$

3 a $PbBr_2(s) \rightleftharpoons Pb^{2+}(aq) + 2Br^-(aq)$

Test yourself 10B

1 $CaSO_4(s) \rightleftharpoons Ca^{2+}(aq) + SO_4^{2-}(aq)$

$$[Ca^{2+}] = [SO_4^{2-}] = \frac{10\text{ mL}}{20\text{ mL}} \times 0.001\text{ mol L}^{-1}$$

$$= 5 \times 10^{-4}\text{ mol L}^{-1}$$

$$\text{Ionic product} = [Ca^{2+}][SO_4^{2-}]$$

$$= (5 \times 10^{-4})^2$$

$$= 2.5 \times 10^{-7}$$

Ionic product $< K_s$ so no precipitate will form.

2 a $[Pb^{2+}] = 0.025\text{ mg L}^{-1}$

$$= 2.5 \times 10^{-5}\text{ g L}^{-1}$$

$$= \frac{2.5 \times 10^{-5}\text{ g L}^{-1}}{207.2\text{ g mol}^{-1}}$$

$$= 1.2 \times 10^{-7}\text{ mol L}^{-1}$$

b $$[Pb^{2+}] = \frac{9\text{ mL} \times 1.2066 \times 10^{-7}\text{ mol L}^{-1}}{(9\text{ mL} + 1\text{ mL})}$$

$$= 1.1 \times 10^{-7}\text{ mol L}^{-1}$$

c $$[CrO_4^{2-}] = \frac{1\text{ mL} \times 0.100\text{ mol L}^{-1}}{(9\text{ mL} + 1\text{ mL})}$$

$$= 0.0100\text{ mol L}^{-1}$$

d $IP = [Pb^{2+}][CrO_4^{2-}]$

$= (1.1 \times 10^{-7}\text{ mol L}^{-1})(0.0100\text{ mol L}^{-1})$

$= 1.1 \times 10^{-9}\text{ mol L}^{-1}$

IP $> K_s$ so precipitation will occur

3 At pH = 13, $[OH^-] = 0.1\text{ mol L}^{-1}$.

$Mg(OH)_2(s) \rightleftharpoons Mg^{2+}(aq) + 2OH^-(aq)$

$$K_s = [Mg^{2+}][OH^-]^2$$

$$\frac{K_s}{[OH^-]^2} = [Mg^{2+}]$$

$$\frac{1 \times 10^{-11}}{(0.1)^2} = [Mg^{2+}]$$

$$1 \times 10^{-9}\text{ mol L}^{-1} = [Mg^{2+}]$$