

- 1.
- (a)  $11.5 \text{ g L}^{-1}$  /1
  - (b)  $M = 46.06 \text{ g mol}^{-1}$  therefore  $0.250 \text{ mol L}^{-1}$  /1
  - (c)  $1.15 \% \text{ w/v}$  /1
  - (d)  $1.15 \times 10^4 \text{ ppm}$  /1

2.  $5 \times 10^{-5} \text{ mol L}^{-1}$  and  $M = 64.05 \text{ g mol}^{-1}$
- $\therefore 3.2 \times 10^{-3} \text{ g L}^{-1}$
  - $\therefore 3.2 \text{ ppm}$  /2

- 3.
- (a)  $M = 126.07 \text{ g mol}^{-1}$   $C = 310 \text{ g L}^{-1} = 2.46 \text{ mol L}^{-1}$  /2
  - (b)  $C_1V_1 = C_2V_2$
  - $\therefore V_2 = \frac{C_1V_1}{C_2}$
  - $\therefore V_2 = \frac{2.46 \times 0.1}{0.5} = 0.492 \text{ L}$
  - The volume of water to be added is  $0.492 - 0.1 = 0.392 \text{ L}$

/3

4.

M	Species	mol L <sup>-1</sup>	g L <sup>-1</sup>	% w/v	mg L <sup>-1</sup>	ppm	ppb
22.99	Na <sup>+</sup>	$7.0 \times 10^{-3}$	0.16	0.016	160	160	$1.6 \times 10^5$
62.01	NO <sub>3</sub> <sup>-</sup>	0.806	50.0	5.00	$5.00 \times 10^4$	$5.00 \times 10^4$	$5.00 \times 10^7$
26.02	CN <sup>-</sup>	$2.7 \times 10^{-9}$	$7.0 \times 10^{-8}$	$7.0 \times 10^{-9}$	$7.0 \times 10^{-5}$	$7.0 \times 10^{-5}$	$7.0 \times 10^{-2}$
200.6	Hg <sup>2+</sup>	$1 \times 10^{-8}$	$2 \times 10^{-6}$	$2 \times 10^{-7}$	$2 \times 10^{-3}$	$2 \times 10^{-3}$	2

/10

5. Fluoride ions  $1.5 \times 10^{-3} \text{ g L}^{-1}$
- Arsenic  $7 \times 10^{-6} \text{ g L}^{-1}$
- /2

6.  $5\% \text{ w/v} = 50 \text{ g L}^{-1}$
- $\therefore 25 \text{ g (500mL)}^{-1}$  /2

TOTAL /25