Nov 2013 9189/5

1 Dilution table

Completing the table -
All values written to 2 d.p , last digit 0 or 5 [1]
Correct subtraction [1]
Value within the range , excluding limits (28.25 to 28.75) [1]

Table of Titration [1]

Enough titres [1]
All subtractions correct, not more than one zero starts [1]
Ticking precise titres and showing calculation of average and completing the summary correctly: 2dps, last digit zero or 5 [1]
[1]

Working formula:

Ratio : $\left| \frac{\text{Vol. of FA1 used by Cand}}{\text{titre of Cand}} - \frac{\text{Vol. of Supervisor}}{\text{titre of Supervisor}} \right|$

ACCURACY MARKS

Sp - penalty

Mark	Difference from supervisor			
12	0,001	≤ 0.001	0.20	
11	0,002	0.001 to 0.00299	0.25	1
10	0,004	0.003 to 0.00699	0.30	2
9	0,007	0.007 to 0.01299	0.35	3
8	0,011	0.013 to 0.02099	0.40	4
7	0,016	0.021 to 0.03099	0.45	5
6	0,022	0.031 to 0.04299	0.50	6
5	0,029	0.043 to 0.05699	0.55	7
4	0,037	0.057 to 0.07299	0.60	8
3	0,046	0.073 to 0.09099	0.65	9
2	0,056	0.091 to 0.11099	0.70	10
1	0,075	0.111 to 0.13599	0.80	11
0	>0,075	≥ 0.13600	> 0.90	12

IB

(a) $n(AgNO_3) = \frac{\text{titre} \times 0.005}{1000}$; [1]

evaluation; [1]

(b) (i) $n(X^-)$ in 25 cm^3 of FA1 = $n(AgNO_3)$ calc. in (a); [1]

Rxn ratio of $(Ag^+ : X^-)$ is 1 : 1

$n(X^-)$ in 250 cm^3 of FA1 = ans (b)(i) $\times \frac{250}{25}$ or ans (a) $\times \frac{250}{25}$ [1]

~~$n(X^-)$ in the volume of FA1 used = $n(X^-)$ in 250 cm^3 FA1;~~ [1]

Evaluation of $\frac{\text{titre}}{1000} \times 0,005 \times 10$ to std form / 3 sfg (A) 2dpl

(b)(ii) Concentration of halide ~~was~~ in the ~~Holy~~ impure water =

~~$\frac{n(X^-) \text{ in 250 cm}^3 \text{ FA1}}{\text{Volume of FA1 used}} \times 1000$~~ or $\frac{\text{ans (b)(i)} \times 1000}{\text{vol of FA1}}$; [1] ~~1T~~

Evaluation to std form or 3 sfg ; [1] (A) 2dpls [1]

(c) More halide ions than just two may be present

ASSESSMENT OF PLANNING SKILL

2 1. Into a 25 cm^3 FA1 add @ least 3 @ titre volume of $AgNO_3$ to precipitate I^- and Cl^-. ~~1T~~

or specified FA1 vol ; proportional vol of titre ; (ie $\times \frac{250}{\text{FA1}}$ ~~1T~~) ; (2)

2. Fold and open a filter paper into a filter funnel. ~~1T~~

(filter ; using filter paper & funnel) [1 + 1]

3. Filter the ppt and retain residue. [1]

4. Weigh the residue on the filter paper [1]

5. ~~Return~~ Retain the residue on the filter funnel [1]

6. Wash the residue with X_s dilute ammonia to dissolve AgCl. [1]

7. Reweigh the residue and filter paper [1]

8. (Wash the residue from the filter paper and) weigh the filter paper [1]

9. Calculate the mass of the total initial residue [1]

10. Calculate the mass of residue after washing with dilute ammonia which is AgI. $(M_7 - M_8)$ [1]

11. Calculate the mass of AgCl by subtracting the second residue mass from the initial residue ~~M_4~~ $(M_4 - M_7)$ [1]

12. Calculate the ratio of AgCl: AgI ie $M_{11} : M_{10}$ [1] ~~1T~~

[13]

[14]

whole # ratio ; (1)

(divide by smaller #)