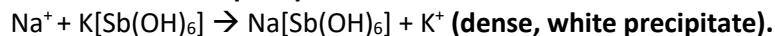**NAME:** Alicia Valls Arrufat (F19038Z)

SAMPLE: Sodium bromide

1) **IDENTIFICATION REACTIONS OF IONS**
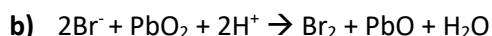
- **CATIONS** *(describe briefly reactions)***:**

a) $Na^+ + K_2CO_3 \rightarrow$ **No precipitate is formed.**
$Na^+ + K[Sb(OH)_6] \rightarrow Na[Sb(OH)_6] + K^+$ **(dense, white precipitate).**

b) Na^+ + methoxyphenilacetic reagent $\rightarrow$ **Voluminous, white, crystalline precipitate.**
Precipitate + NH_4^+ (d) $\rightarrow$ **Precipitate dissolves completely**
Dissolution + $(NH_4)_2CO_3 \rightarrow$ **No precipitate.**

- **ANIONS** *(describe briefly reactions)***:**
a) $Br^- + Ag^+ \rightarrow AgBr$ **(curled, pale yellow precipitate).**
$AgBr + 2NH_3 \rightarrow [Ag(NH_3)_2]+ Br^-$ **(precipitate dissolves with difficulty).**

b) $2Br^- + PbO_2 + 2H^+ \rightarrow Br_2 + PbO + H_2O$
A violet color appears when dipping a filter paper with decolorized fuchsin solution R.

2) **ASSAY:** BACK TITRATION

Volumetric solutions: silver nitrate and ammonium thiocyanate.

Titre of volumetric solutions: 0,1M $AgNO_3$: 0.9998**;** 0,1M NH_4SCN: 0.9897

Titration No.	m [g] *(4 decimal places)*	Consumption of VS [ml]	ASSAY
1.	1,9854	5,86	99,486
2.	2,0125	5,47	100,120
3.	2,0245	5,05	101,640
4.	2,0998	4,90	98,722
		Average	**100,005**

CALCULATION PROCEDURE:

$$X\,(\%) = \frac{(V1 \times f1 - V2 \times f2) \times m \times 100}{q}$$

V1 = 25ml   f2 = 0,9897

f1 = 0,9998   m = 10,29 mg

Titration nº 1

1,9854g in 100ml → 0,19854g in 10ml → q = 0,19854 g = 198,54 mg

V2 = 5,86ml

$$X\,(\%) = \frac{(25\text{ml} \times 0,9998 - 5,86\text{ml} \times 0,9897) \times 10,29\text{mg} \times 100}{198,54\text{mg}} = \mathbf{99,486}$$

Titration nº 2

2,0125g in 100ml → 0,201254g in 10ml → q = 0,20125 g = 201,25 mg

V2 = 5,47ml

$$X\,(\%) = \frac{(25\text{ml} \times 0,9998 - 5,47\text{ml} \times 0,9897) \times 10,29\text{mg} \times 100}{201,25\text{mg}} = \mathbf{100,120}$$

Titration nº 3

2,0245g in 100ml → 0,20245g in 10ml → q = 0,20245 g = 202,45 mg

V2 = 5,05ml

$$X\,(\%) = \frac{(25\text{ml} \times 0,9998 - 5,05\text{ml} \times 0,9897) \times 10,29\text{mg} \times 100}{202,45\text{mg}} = \mathbf{101,640}$$

Titration nº 4

2,0998g in 100ml → 0,209984g in 10ml → q = 0,20998g = 209,98mg

V2 = 4,90ml

$$X\,(\%) = \frac{(25\text{ml} \times 0,9998 - 4,90\text{ml} \times 0,9897) \times 10,29\text{mg} \times 100}{209,98\text{mg}} = \mathbf{98,722}$$

Statistical calculation

$$R = Xmax - Xmin = 101,640 - 98,722 = \mathbf{2,868}$$

$$SD = k_n \times R = 0,4857 \times 2,868 = \mathbf{1,3929}$$

$$RSD = \frac{SD}{\bar{x}} \times 100 = \frac{1,3929}{100,005} \times 100 = \mathbf{1,3928}$$

STATISTICAL EVALUATION:

Range: **R =** 2,868

Standard deviation *(estimated from range)***:**   **sd =** 1,3929

Relative standard deviation: **RSD =** 1,3928

CONCLUSION *(does your sample meet/not meet Ph. Eur)***:** In the Pharmacopoeia we can see that for meeting the requirement we need a content of *Sodium Bromide* between 98,0 – 100,5 per cent. Our sample has a content of 100,005 so we can conclude that it meets the Pharmacopoeia requirements.