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**SAMPLE: Potassium Chloride**

**1) IDENTIFICATION REACTIONS OF IONS**

- **CATIONS** (*describe briefly reactions*): **Potassium (K<sup>+</sup>)**

1. Dissolve 0.1g of the substance to be examined in 2ml of water R or use 2ml of the prescribed solution. Add 1ml of sodium carbonate solution R and heat. No precipitate is formed. Add to the hot solution .05ml of sodium sulphide solution R. No precipitate is formed. Cool in iced water and 2ml of a 150g/L solution of tartaric acid R. allow to stand. A white crystalline precipitate is formed.
2. Dissolve about 40mg of the substance to be examined in 1ml of water R or use 1ml of the prescribed solution. Add 1ml of dilute acetic acid R and 1ml of a freshly prepared 100g/L solution of sodium cobaltinitrite R. A yellow or orange-yellow precipitate is formed immediately.

- **ANIONS** (*describe briefly reactions*): **Chloride (Cl<sup>-</sup>)**

1. Dissolve in 2ml of water R a quantity of the substance to be examined equivalent to about 2mg of chloride or 2ml of the prescribed solution. Acidify with dilute nitric acid R and add 0.4ml of silver nitrate solution R1. Shake and allow to stand. A curdled, white precipitate is formed. Centrifuge and wash the precipitate with three quantities, each of 1 ml of water R. Carry out this operation rapidly in subdued light, disregarding the fact that the supernatant solution may not become perfectly clear. Suspend the precipitate in 2ml of water R and add 1.5ml of ammonia R. The precipitate dissolves easily with the possible exception of a few large particles which dissolve slowly.
2. Introduce into a test-tube a quantity of the substance to be examined equivalent to about 15mg of chloride or the prescribed quantity. Add 0.2g of potassium dichromate R and 1ml of sulfuric acid R. place a filter-paper strip impregnated with 0.1ml of diphenyl carbazide solution R over the opening of the test-tube. The paper turns violet-red. The impregnated paper must not come into contact with the potassium dichromate.

## 2) ASSAY

Volumetric solutions: 0.1 M Ag NO<sub>3</sub>(Silver Nitrate), 0.1M Ammonium thiocyanate

Titre of volumetric solutions: 0.9998 , 0.9897

Titration No.	m [g] (4 decimal places)	Consumption of VS [ml]	ASSAY
1.	1.3256 g	10.56	81.85
2.	1.2988 g	10.87	81.77
3.	1.3004 g	10.35	84.63
4.	1.3006 g	10.54	83.53
Average			82.95

## CALCULATION PROCEDURE:

$$1. \quad x (\%) = \frac{((V_1 \cdot f_1) - (V_2 \cdot F_2)) \cdot m \cdot 100}{q}$$

$$V_2 = 10.56 \text{ ml} \quad F_2 = 0.9897 \quad M = 7.46 \text{ mg/ml} \quad q = 1.3256 \text{ g} (1325.6 \text{ mg}) \quad F_1 = 0.9998, \quad V_1 = 25 \text{ ml}$$

$$X = \frac{((25 \cdot 0.9998) - (10.56 \cdot 0.9897)) \cdot 7.46 \cdot 100}{1325.6}$$

$$= 8.1847 \times 10 = \mathbf{81.8471}$$

$$2. \quad x (\%) = \frac{((V_1 \cdot f_1) - (V_2 \cdot F_2)) \cdot m \cdot 100}{q}$$

$$= \frac{(25 \cdot 0.9998) - (10.87 \cdot 0.9897) \cdot 7.46 \cdot 100}{1298.8}$$

$$= 8.17737 \times 10 = \mathbf{81.7737}$$

$$3. \quad x (\%) = \frac{((V_1 \cdot f_1) - (V_2 \cdot F_2)) \cdot m \cdot 100}{q}$$

$$X = \frac{((25 \cdot 0.9998) - (10.35 \cdot 0.9897)) \cdot 7.46 \cdot 100}{1300.4}$$

$$= 8.4625 \times 10 = \mathbf{84.6254}$$

$$4. \quad x (\%) = \frac{((V_1 \cdot f_1) - (V_2 \cdot F_2)) \cdot m \cdot 100}{q}$$

$$X = \frac{((25 \cdot 0.9998) - (10.54 \cdot 0.9897)) \cdot 7.46 \cdot 100}{1300.6}$$

$$= 8.35338 \times 10 = \mathbf{83.5339}$$

**STATISTICAL EVALUATION:****Range:**

$$R = (X_{\max} - X_{\min}) = 84.63 - 81.77 = 2.86$$

**Standard deviation (estimated from range):**

$$sd = k_n * R = K_4 * R = 0.4857 * 2.86 = 1.3891$$

**Relative standard deviation:**

$$RSD = (SD / AVERAGE) * 100 =$$

$$(1.3891 / 82.95) * 100 = 1.6746$$

**CONCLUSION** (*does your sample meet/not meet Ph. Eur*):

Potassium chloride **doesn't meet pharmacopeia** because our content says that potassium chloride is found in the range of 99% to 100.5%. Our average is 82.945% and it's not in the range of content that is given to us.